

EXHIBIT 32

REDACTED

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION

UNITED STATES OF AMERICA, :
et al., :
 :
Plaintiffs :
 :
v. : No. 1:23-cv-00108
 :
GOOGLE, LLC, :
 :
Defendant. :

Tuesday, February 20, 2024

Video Deposition of RAMAMOORTHY RAVI,
PH.D., taken at the Offices of the United States
Department of Justice, 450 Fifth Street
Northwest, Washington, D.C., beginning at 9:32
a.m. Eastern Standard Time, before Ryan K. Black,
Registered Professional Reporter, Certified
Livenote Reporter and Notary Public in and for
the District of Columbia

Job No. CS6456599

<p style="text-align: right;">Page 2</p> <p>1 APPEARANCES:</p> <p>2 UNITED STATES DEPARTMENT OF JUSTICE</p> <p>3 ANTITRUST DIVISION</p> <p>4 BY: MICHAEL WOLIN, ESQ.</p> <p>5 JAMES RYAN, ESQ.</p> <p>6 JULIA TARVER-WOOD, ESQ.</p> <p>7 450 5th Street, N.W.</p> <p>8 Washington, DC 20530</p> <p>9 202.514.2414</p> <p>10 michael.wolin@usdoj.gov</p> <p>11 james.a.ryan@usdoj.gov</p> <p>12 julia.tarver-wood@usdoj.gov</p> <p>13 Representing - The United States of America</p> <p>14 NORTH CAROLINA DEPARTMENT OF JUSTICE</p> <p>15 BY: JONATHAN MARX, ESQ. - Via Zoom</p> <p>16 1 South Wilmington Street</p> <p>17 Raleigh, North Carolina 27601</p> <p>18 919.716.6400</p> <p>19 jmarx@ncdoj.gov</p> <p>20 Representing - State Plaintiffs</p> <p>21 PAUL, WEISS, RIFKIND, WHARTON & GARRISON LLP,</p> <p>22 BY: WILLIAM A. ISSACSON, ESQ.</p> <p>23 LEAH HIBBLER, ESQ.</p> <p>24 2001 K St NW,</p> <p>25 Washington, DC</p> <p>202.223.7341</p> <p>wisaacson@paulweiss.com</p> <p>lhibbler@paulweiss.com</p> <p>- and -</p> <p>AXINN, VELTROP & HARKRIDER, LLP</p> <p>BY: RUSSELL M. STEINTHAL, ESQ.</p> <p>114 West 47th Street</p> <p>New York, New York 10036</p> <p>212.728.2200</p> <p>rsteintal@axinn.com</p> <p>Representing - Google LLC</p>	<p style="text-align: right;">Page 4</p> <p>1 INDEX</p> <p>2 TESTIMONY OF: RAMAMOORTHY RAVI, PH.D. PAGE</p> <p>3 By Mr. Isaacson.....8</p> <p>4 By Mr. Wolin.....306</p> <p>5 EXHIBITS</p> <p>6 EXHIBIT DESCRIPTION PAGE</p> <p>7 Ravi 1 Dr. Ravi's Expert Report, dated</p> <p>8 December 22, 2023.....6</p> <p>9 Ravi 2 Dr. Ravi's Expert Rebuttal Report,</p> <p>10 dated February 13, 2024.....6</p> <p>11 Ravi 3 an article from the Journal of</p> <p>12 Marketing Research 2021 Vol. 58(5)</p> <p>13 888-907, titled First-Price Auctions</p> <p>14 in Online Display Advertising.....29</p> <p>15 Ravi 4 a document Bates Numbered</p> <p>16 GOOG-DOJ-AT-02307442 through</p> <p>17 GOOG-DOJ-AT-02307446.....115</p> <p>18 Ravi 5 a textbook titled "Customer-Centric</p> <p>19 Marketing," A Pragmatic Framework,</p> <p>20 authored by R. Ravi and</p> <p>21 Baohong Sun.....177</p> <p>22 Ravi 6 a document Bates Numbered</p> <p>23 GOOG-AT-MDL-001412832 through</p> <p>24 GOOG-AT-MDL-001412884.....216</p> <p>25 Ravi 7 a document Bates Numbered</p> <p>GOOG-DOJ-10806862 through</p> <p>GOOG-DOJ-10806869.....231</p> <p>Ravi 8 a document Bates Numbered</p> <p>GOOG-DOJ-05282625 through</p> <p>GOOG-DOJ-05282671.....234</p> <p>Ravi 9 a printout of an article from</p> <p>"Audience Network," Facebook.com/</p> <p>audienetwork/partner-program/</p> <p>code-of-conduct.....240</p>
<p style="text-align: right;">Page 3</p> <p>1 ALSO PRESENT:</p> <p>2 David Campbell - Legal Videographer</p> <p>3 Suzanne Majewski - USDOJ Economist</p> <p>4 Elizabeth Aramayo - USDOJ paralegal</p> <p>5 Emily Reed - USDOJ paralegal</p> <p>6 Ann Ashley Daniel - USDOJ paralegal</p> <p>7 James Banovetz, Ph.D - Brattle Group</p> <p>8 Minjae Song, Ph.D - Brattle Group - Via Zoom</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p style="text-align: right;">Page 5</p> <p>1 INDEX (Cont'd)</p> <p>2 EXHIBIT DESCRIPTION PAGE</p> <p>3 Ravi 10 an article from Xandr.com titled</p> <p>4 "Seller Best Practices,".....241</p> <p>5 Ravi 11 a document Bates Numbered</p> <p>6 GOOG-DOJ-15044036 through</p> <p>7 GOOG-DOJ-15044043.....247</p> <p>8 Ravi 12 a document Bates Numbered</p> <p>9 GOOG-DOJ-AT-0571933 through</p> <p>10 GOOG-DOJ-AT-0571935.....250</p> <p>11 Ravi 13 a document Bates Numbered</p> <p>12 GOOG-DOJ-06842351 through</p> <p>13 GOOG-DOJ-06842362.....275</p> <p>14 Ravi 14 a document Bates Numbered</p> <p>15 GOOG-DOJ-1270489 through</p> <p>16 GOOG-DOJ-1270501.....280</p> <p>17 Ravi 15 a document Bates Numbered</p> <p>18 GOOG-DOJ-13469175 through</p> <p>19 GOOG-DOJ-13469183.....281</p> <p>20 Ravi 16 a document Bates Numbered</p> <p>21 GOOG-DOJ-15637938 through</p> <p>22 GOOG-DOJ-15637940.....285</p> <p>23 Ravi 17 an excerpt of the deposition</p> <p>24 transcript of Omri Farber, dated</p> <p>25 Monday, September 18, 2023.....286</p>

<p style="text-align: right;">Page 62</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. Okay. And before this case, had you</p> <p>3 heard the term "open web display"?</p> <p>4 A. Do you just mean the term "open web</p> <p>5 display" or "open web display advertising"?</p> <p>6 Q. Open web display advertising, yes.</p> <p>7 A. Open web display advertising, yes, I --</p> <p>8 Q. Had you heard those four words together</p> <p>9 before this case?</p> <p>10 A. I believe I should have come across that</p> <p>11 before this case.</p> <p>12 Q. Do you remember where?</p> <p>13 A. Open auctions versus private auctions is</p> <p>14 something I heard about early on.</p> <p>15 Q. All right. So you were familiar with</p> <p>16 the term "open web display advertising" because</p> <p>17 you were familiar with open auctions versus</p> <p>18 private auctions; is that right?</p> <p>19 MR. WOLIN: Objection to form.</p> <p>20 THE WITNESS: That -- that's the</p> <p>21 connection I made to open web display</p> <p>22 advertising.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. All right. Open web display advertising</p> <p>25 is something used in open auctions as opposed to</p>	<p style="text-align: right;">Page 64</p> <p>1 expertise in digital advertising and your</p> <p>2 writings in that area, the markets that you are</p> <p>3 familiar with are display advertising market and</p> <p>4 a digital advertising market that are referred to</p> <p>5 in your article; is that correct?</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: The first line in the</p> <p>8 article, like in many research articles, is meant</p> <p>9 to motivate the importance of the aspect being</p> <p>10 studied. And that was the purpose of that first</p> <p>11 sentence, that display advertising is a large</p> <p>12 -- in this particular case -- a 54 percent</p> <p>13 fraction of the digital advertising market,</p> <p>14 as defined in that citation.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. And that -- you say it's motivated</p> <p>17 -- when you say it's motivated, you're not trying</p> <p>18 to say that it's incorrect, are you?</p> <p>19 MR. WOLIN: Objection to form.</p> <p>20 THE WITNESS: We have a citation to a</p> <p>21 public-facing information source that --</p> <p>22 BY MR. ISAACSON:</p> <p>23 Q. Right. And -- and at the time of this</p> <p>24 article, based on your expertise in digital</p> <p>25 advertising, you understood there was a digital</p>
<p style="text-align: right;">Page 63</p> <p>1 private auctions? Is that your understanding?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: Loosely speaking. I</p> <p>4 haven't thought deeply about these terms.</p> <p>5 I -- I have come across them as a way of</p> <p>6 understanding what the distinction is between the</p> <p>7 private and the open sale of these display ads.</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q. All right. So based on your background</p> <p>10 -- and you've told me before you've got some</p> <p>11 expertise in the area of digital advertising,</p> <p>12 correct?</p> <p>13 A. Yes. I -- I did mention earlier that.</p> <p>14 Q. Right. And based on your expertise in</p> <p>15 the field of digital advertising, the way you</p> <p>16 understood the term "open web display</p> <p>17 advertising" is that's something used in</p> <p>18 connection with an open auction for advertising</p> <p>19 as opposed to a private auction?</p> <p>20 MR. WOLIN: Objection to form.</p> <p>21 THE WITNESS: It is one of the ways I</p> <p>22 related to that term, since you were asking me</p> <p>23 about my familiarity with that phrase.</p> <p>24 BY MR. ISAACSON:</p> <p>25 Q. All right. And in terms of your</p>	<p style="text-align: right;">Page 65</p> <p>1 advertising market. That's the title, right,</p> <p>2 there: "Evolution of Display Advertising Market"?</p> <p>3 And that you also -- and that there was also a</p> <p>4 digital advertising market referred to in the</p> <p>5 first sentence, correct?</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: Yes. The first sentence</p> <p>8 talks about that.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. We can -- your report -- in your summary</p> <p>11 of opinions, Paragraph 12(a), which is discussing</p> <p>12 the Waterfall and Dynamic Allocation?</p> <p>13 A. I see that.</p> <p>14 Q. Do you see that?</p> <p>15 And you see in the bolded title,</p> <p>16 it says that the wat -- "The Waterfall and</p> <p>17 Dynamic Allocation" -- amongst other things -</p> <p>18 "Harmed Google's Own customers." Do you see</p> <p>19 that?</p> <p>20 A. Yes, it says "Potentially Harmed</p> <p>21 Google's Own Customers."</p> <p>22 Q. Potentially. Yes. Thank you.</p> <p>23 Are you reaching the conclusion that</p> <p>24 it actually harmed Google's own customers, the</p> <p>25 Waterfall and Dynamic Allocation? Or was that</p>

Page 94	Page 96
<p>1 account . . .</p> <p>2 A. That was the one to three percent</p> <p>3 citation earlier.</p> <p>4 Q. Oh, so the one to three percent is to</p> <p>5 one rival?</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: We are looking at</p> <p>8 Footnotes 499 and 498 in Page 116 of my report.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. All right. With regards to Rubicon,</p> <p>11 that's one rival, correct?</p> <p>12 A. That's correct. That's the latter one</p> <p>13 that I cited.</p> <p>14 Q. Right.</p> <p>15 A. The reduction in vendor rate, yes.</p> <p>16 Q. Did you do anything to attempt to</p> <p>17 quantify the effect of Google's conduct on rivals</p> <p>18 other than look at documentation about Google</p> <p>19 experiments?</p> <p>20 MR. WOLIN: Objection to form.</p> <p>21 THE WITNESS: To examine the effect on</p> <p>22 rivals, I had to read the -- the design documents</p> <p>23 of these conducts to understand how they worked.</p> <p>24 As I mentioned earlier, I had to look through</p> <p>25 pseudocode, snapshots of the source code, and</p>	<p>1 that I --</p> <p>2 Q. And did you not attempt to replicate the</p> <p>3 work of any of those experiments, correct?</p> <p>4 MR. WOLIN: Objection to form.</p> <p>5 THE WITNESS: I did not carry out any</p> <p>6 data experiments involving simulations related to</p> <p>7 these conducts.</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q. All right. You -- you have not carried</p> <p>10 out any experiments in this case related to the</p> <p>11 Google conduct that you discuss in your reports,</p> <p>12 correct?</p> <p>13 MR. WOLIN: Objection to form.</p> <p>14 THE WITNESS: As I was saying just a</p> <p>15 moment ago, I did not run any simulations or</p> <p>16 regressions on data in arriving at the opinions</p> <p>17 in my report.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q. All right. If I can jump ahead here to</p> <p>20 Paragraph 258 of your opening report.</p> <p>21 And here you're discussing the subject</p> <p>22 of what you say "Google's restriction of Google</p> <p>23 Ads' demand primarily to AdX." Do you see that?</p> <p>24 A. Yes. I see Paragraph 258.</p> <p>25 Q. And as I understand your concern here</p>
Page 95	Page 97
<p>1 then read the communications related to</p> <p>2 experiments around these conducts that Google</p> <p>3 conducted internally and the email discussion</p> <p>4 about the motivations and the results of these</p> <p>5 conducts.</p> <p>6 BY MR. ISAACSON:</p> <p>7 Q. So but my question is more specific than</p> <p>8 what did -- I'm not asking you what you did to</p> <p>9 examine the effect on rivals. I'm asking you</p> <p>10 what did you do to quantify the effect of</p> <p>11 Google's conduct on rivals. So I'm going to ask</p> <p>12 you the question again: Did you do anything to</p> <p>13 attempt to quantify the effect of Google's</p> <p>14 conduct on rivals other than look at</p> <p>15 documentation about Google experiments?</p> <p>16 MR. WOLIN: Objection to form.</p> <p>17 THE WITNESS: My main source of</p> <p>18 conclusions about the -- the directional changes</p> <p>19 and the magnitudes of the effect on rivals are</p> <p>20 experiments on all of these conducts.</p> <p>21 BY MR. ISAACSON:</p> <p>22 Q. And you're referring -- when you say</p> <p>23 your main source is experiments, you mean Google</p> <p>24 experiments?</p> <p>25 A. That's correct. The Google experiment</p>	<p>1 is that Google Ads demand would be primarily</p> <p>2 available only from AdX.</p> <p>3 MR. WOLIN: Objection to form.</p> <p>4 THE WITNESS: Primarily that would be</p> <p>5 the case, yes. Google Ads, advertisements,</p> <p>6 advertisers were available through AdX.</p> <p>7 BY MR. ISAACSON:</p> <p>8 Q. And when you say "Google Ads demand,"</p> <p>9 what do you mean?</p> <p>10 A. The requests for placing advertisements</p> <p>11 that arose from buyers that were affiliated with</p> <p>12 Google Ads.</p> <p>13 Q. Now, if DoubleClick for Publishers and</p> <p>14 AdX were offered as completely separate products</p> <p>15 but Google Ads demand was still not available to</p> <p>16 non-AdX exchanges, you would have the same</p> <p>17 concern, correct?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: I did not really consider</p> <p>20 the possibility of DFP and AdX being separate.</p> <p>21 I think that's what you were asking about.</p> <p>22 BY MR. ISAACSON:</p> <p>23 Q. Mm-hmm. What your concern is is that</p> <p>24 Google Ads demand would have to be made available</p> <p>25 to non-AdX -- AdX exchanges. That's what you</p>

25 (Pages 94 - 97)

<p style="text-align: right;">Page 98</p> <p>1 want, right?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: I do not have any specific</p> <p>4 wants in this case.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. Well, the -- that's fair. But the re --</p> <p>7 what you call a "restriction of Google Ads</p> <p>8 demand" means that Google Ads demand is not</p> <p>9 available on non-AdX exchanges, correct?</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: It is a statement of where</p> <p>12 Google Ads' demand is broadly available, and it</p> <p>13 was for -- and it still is mainly available</p> <p>14 through AdX.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. And not available on non-AdX exchanges?</p> <p>17 A. I -- I mentioned in a footnote somewhere</p> <p>18 about other programs. It's also in my appendix</p> <p>19 picture where I believe Google Ads tried to bid</p> <p>20 in other exchanges for particularly valuable</p> <p>21 impressions.</p> <p>22 Q. Right. But at the end of Paragraph 258</p> <p>23 you say, "As a result" -- and I believe you're</p> <p>24 referring to Google's restriction of Google Ads</p> <p>25 demand primarily to AdX -- "non-Google providers</p>	<p style="text-align: right;">Page 100</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. Do you have any idea as to the scope of</p> <p>3 that work, how much work would be required, based</p> <p>4 on your background in computer science?</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: Bidding in realtime</p> <p>7 auctions via OpenRTB, I believe, became available</p> <p>8 in 2010. So, I believe there would be some</p> <p>9 technology to approach that question.</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q. All right. But would you have -- in</p> <p>12 order to make Google Ads demand available in</p> <p>13 exchanges other than Google's AdX, you would have</p> <p>14 to do technical work in order to make that demand</p> <p>15 available at -- at those other exchanges,</p> <p>16 correct?</p> <p>17 MR. WOLIN: Objection to form.</p> <p>18 THE WITNESS: As in any other case of</p> <p>19 trying to buy from a different exchange, there</p> <p>20 would be technical work involved.</p> <p>21 BY MR. ISAACSON:</p> <p>22 Q. Right. You would have to take the</p> <p>23 exchanges of competitors of Google and connect</p> <p>24 them to Google Ads' demand in a way that was</p> <p>25 compatible with the technology of those</p>
<p style="text-align: right;">Page 99</p> <p>1 of ad tech products would struggle to attract new</p> <p>2 customers or retain existing customers." Do you</p> <p>3 see that?</p> <p>4 A. I see that sentence.</p> <p>5 Q. Right. And so in order to avoid that</p> <p>6 situation where those non-Google providers of ad</p> <p>7 tech products were struggling, what would have to</p> <p>8 happen is they would have to have access to</p> <p>9 Google Ads demand; is that correct?</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: That would be a reasonable</p> <p>12 possibility, yeah.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. And the non-Google providers of ad tech</p> <p>15 products there, those are non-AdX exchanges,</p> <p>16 correct?</p> <p>17 A. I think you're referring to non-AdX</p> <p>18 exchanges, yes.</p> <p>19 Q. Right. And if -- if Google Ads demand</p> <p>20 was going to be made available to non-AdX</p> <p>21 exchanges, what technical work would be required</p> <p>22 for that?</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: I did not quite examine</p> <p>25 that question that you're asking me.</p>	<p style="text-align: right;">Page 101</p> <p>1 competitors.</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: That's broadly true, as it</p> <p>4 is true for AdX.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. All right. And engineers -- some number</p> <p>7 of engineers would actually have to go to work</p> <p>8 and make sure that Google Ads' demand could be</p> <p>9 sent to these other exchanges, and in a way that</p> <p>10 was suitable and interoperable with those -- with</p> <p>11 their technology?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: As I believe they did with</p> <p>14 AWBid, that is the case.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. Right. And different exchanges could</p> <p>17 have different technical systems, and so that</p> <p>18 engineering work might have to vary from rival to</p> <p>19 rival, correct?</p> <p>20 MR. WOLIN: Objection to form.</p> <p>21 THE WITNESS: What you're saying is</p> <p>22 reasonable, yeah. Trying to make yourself</p> <p>23 compatible with different technical interfaces</p> <p>24 requires additional work.</p> <p>25 BY MR. ISAACSON:</p>

Page 102	Page 104
<p>1 Q. Right. And --</p> <p>2 MR. WOLIN: Counsel, when you get a --</p> <p>3 we've been going for an hour -- sorry to</p> <p>4 interrupt -- when you get to a good spot.</p> <p>5 MR. ISAACSON: I'll wrap it up. Yeah.</p> <p>6 BY MR. ISAACSON:</p> <p>7 Q. So when you're talking about a hundred</p> <p>8 or more non-Google exchanges, do you have any</p> <p>9 idea how much engineering work would have to be</p> <p>10 done in order to make -- for Google to say "we're</p> <p>11 gonna send our Google Ads demand to all of these</p> <p>12 exchanges"?</p> <p>13 MR. WOLIN: Objection to form.</p> <p>14 THE WITNESS: I did not examine that</p> <p>15 particular question, but some of this work seems</p> <p>16 to have been carried out by AWBid and Marple.</p> <p>17 MR. ISAACSON: Okay.</p> <p>18 MR. WOLIN: All right. Let's take a</p> <p>19 break and go off the record.</p> <p>20 THE VIDEOGRAPHER: All right. Off the</p> <p>21 record at 12:03.</p> <p>22 (Recess taken.)</p> <p>23 THE VIDEOGRAPHER: Back on the record at</p> <p>24 12:18.</p> <p>25 BY MR. ISAACSON:</p>	<p>1 advertisers and the exchanges, and the publisher</p> <p>2 ad service have publishers and the ad exchanges,</p> <p>3 if you will, and sometimes other buyers like</p> <p>4 SSBs.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. All right. The -- now, you have said in</p> <p>7 your report that Google has -- Google's AdX has</p> <p>8 gained scale because Google Ads bid primarily</p> <p>9 into AdX. Is that generally right?</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: Are we looking at the same</p> <p>12 paragraph?</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. No. No. I think you've said it many</p> <p>15 times now.</p> <p>16 A. Generally, yes.</p> <p>17 MR. WOLIN: Objection to form.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q. Your report does not quantify how much</p> <p>20 scale Google gained from Google Ads bidding</p> <p>21 primarily to AdX; is that correct?</p> <p>22 MR. WOLIN: Objection to form.</p> <p>23 THE WITNESS: As we were discussing</p> <p>24 before the break, there are experiments that</p> <p>25 reveal the increase in the number of impressions</p>
Page 103	Page 105
<p>1 Q. Looking at Paragraph 258 again of your</p> <p>2 report where we left off, --</p> <p>3 A. Yes.</p> <p>4 Q. -- you say in the middle of the</p> <p>5 paragraph, "Theory from academic research on</p> <p>6 two-sided platforms similarly posits that marquis</p> <p>7 buyers in a platform make it more attractive to</p> <p>8 sellers."</p> <p>9 Do you consider the Google Ad technology</p> <p>10 that you have looked at in this case to be a</p> <p>11 two-sided platform?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: Section 4(b) in my report</p> <p>14 is about that and, indeed, Ad Exchange is a</p> <p>15 two-sided platform.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. Have you looked at any of the Google</p> <p>18 technology in this case other than Google AdX?</p> <p>19 A. I've also examined Google Ads, DV360 and</p> <p>20 DFP.</p> <p>21 Q. All right. And do you consider any of</p> <p>22 them to be two-sided platforms?</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: To some extent, they are.</p> <p>25 The buy-side products have as the two sides the</p>	<p>1 that, for example, AdX is able to win because of</p> <p>2 some of these conducts.</p> <p>3 BY MR. ISAACSON:</p> <p>4 Q. So other than looking at documents</p> <p>5 describing Google experiments, your report does</p> <p>6 not attempt to quantify how much scale Google</p> <p>7 gained from Google Ads bidding primarily into</p> <p>8 AdX; is that correct?</p> <p>9 MR. WOLIN: Objection to form.</p> <p>10 THE WITNESS: Again, as we were</p> <p>11 discussing earlier, while I use the Google</p> <p>12 documentary evidence to talk about the increase</p> <p>13 in the scale of some of Google's products, I</p> <p>14 don't have an explicit quantification of -- of</p> <p>15 that using any data experiments that I have.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. And you -- I believe you said this</p> <p>18 before the break, but I want to get this</p> <p>19 straight. You have not looked at any effects</p> <p>20 from -- from any integration of DoubleClick for</p> <p>21 Publisher with AdX; is that right?</p> <p>22 MR. WOLIN: Objection to form.</p> <p>23 THE WITNESS: Before the break, we were</p> <p>24 talking about the availability of Google Ads</p> <p>25 mainly via AdX.</p>

<p style="text-align: right;">Page 118</p> <p>1 THE WITNESS: I did examine that, and</p> <p>2 I'm looking for that proportion in the report in</p> <p>3 Appendix G.</p> <p>4 (Reviews document.)</p> <p>5 Yeah. I don't seem to be able to find</p> <p>6 that denominator here of the -- the amount of</p> <p>7 spend in third-party exchanges and their growth</p> <p>8 over time.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. The waterfall we've been discussing</p> <p>11 today -- and you discussed that in your 20</p> <p>12 -- 2021 article that we looked at also, right?</p> <p>13 A. Yes, we did somewhat.</p> <p>14 Q. Were you familiar with the existence of</p> <p>15 the waterfall before your art -- 2021 article?</p> <p>16 A. Yes, I was familiar with the waterfall</p> <p>17 before I wrote that article.</p> <p>18 Q. The -- the waterfall was used generally</p> <p>19 by sellers or sell-side platforms. It wasn't</p> <p>20 exclusive to Google, correct?</p> <p>21 MR. WOLIN: Objection to form.</p> <p>22 THE WITNESS: I believe the waterfall</p> <p>23 existed in DFP before it was purchased by Google.</p> <p>24 BY MR. ISAACSON:</p> <p>25 Q. And, well, looking at Paragraph 61 of</p>	<p style="text-align: right;">Page 120</p> <p>1 Q. All right. And what was remaining was</p> <p>2 space available for advertising that hadn't been</p> <p>3 sold?</p> <p>4 A. The remnant space of digital inventory,</p> <p>5 yes.</p> <p>6 Q. Okay. The waterfall enables publishers</p> <p>7 to get a quick and reasonably high bid for an</p> <p>8 impression.</p> <p>9 MR. WOLIN: Objection to form.</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q. Do you agree with that?</p> <p>12 MR. WOLIN: Same objection.</p> <p>13 THE WITNESS: In the early 2000s, as</p> <p>14 display advertising was coming into the fore,</p> <p>15 that was the case.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. All right. And -- and that -- if you</p> <p>18 look at your article, Exhibit 3, you wrote in</p> <p>19 2021 at Page 889 -- where is this?</p> <p>20 Okay. In the middle of the first column</p> <p>21 on the left -- nope. That's not it.</p> <p>22 Help me out here. It -- oh, there we</p> <p>23 are.</p> <p>24 So, yes, on the left-hand column, the</p> <p>25 first full paragraph that begins "Early methods."</p>
<p style="text-align: right;">Page 119</p> <p>1 your report, you say in the second sentence,</p> <p>2 "Generally speaking, the waterfall describes a</p> <p>3 setup where a seller or sell-side platform (in</p> <p>4 this case, DFP)" . . . and then you go on to</p> <p>5 describe it.</p> <p>6 The waterfall was something that was</p> <p>7 generally being used by sellers, sell-side</p> <p>8 platforms, and including DFP, correct?</p> <p>9 MR. WOLIN: Objection to form.</p> <p>10 THE WITNESS: Yeah. The footnote also</p> <p>11 confirms that. It was a traditional way of</p> <p>12 accessing demand from several sources.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. All right. The waterfall was industry</p> <p>15 standard from about 2000 to 2010, correct?</p> <p>16 MR. WOLIN: Objection to form.</p> <p>17 THE WITNESS: The waterfall was</p> <p>18 prevalent in the early days of remnant sales.</p> <p>19 BY MR. ISAACSON:</p> <p>20 Q. Okay. And what do you mean by "remnant</p> <p>21 sales"?</p> <p>22 A. Remnant is a term I use here, and also</p> <p>23 in other places in the report, to refer to what</p> <p>24 traditionally was remaining after satisfying</p> <p>25 guaranteed contracts.</p>	<p style="text-align: right;">Page 121</p> <p>1 A. Yes.</p> <p>2 Q. And if you move down 10 or 12 lines you</p> <p>3 start to see discussion of remnants and early</p> <p>4 publisher networks.</p> <p>5 A. Yes.</p> <p>6 Q. And what you wrote there, "Early</p> <p>7 publisher networks that process remnant inventory</p> <p>8 prefer to send their requests for bids to only a</p> <p>9 few reliable large advertising networks or</p> <p>10 exchanges so as to get a quick and reasonably</p> <p>11 high bid for the impression."</p> <p>12 That's what you wrote about the</p> <p>13 waterfall in 2021, correct?</p> <p>14 A. Yes. That's what I wrote about early</p> <p>15 publisher networks.</p> <p>16 Q. All right. And I think you said that</p> <p>17 the waterfall was developed by DoubleClick prior</p> <p>18 to its acquisition by Google.</p> <p>19 MR. WOLIN: Objection to form.</p> <p>20 THE WITNESS: I believe I said that DFP</p> <p>21 had implemented a waterfall prior to Google</p> <p>22 acquiring it. I'm not sure if they developed it.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. That's -- that's fair. So, right, the</p> <p>25 waterfall existed in DoubleClick for Publishers</p>

<p style="text-align: right;">Page 122</p> <p>1 prior to its being acquired by Google?</p> <p>2 A. I believe that is the case. I have a</p> <p>3 citation for it.</p> <p>4 Q. Right.</p> <p>5 And dynamic allocation you say the same</p> <p>6 thing; that dynamic allocation existed in</p> <p>7 DoubleClick prior to Google acquiring it, right?</p> <p>8 MR. WOLIN: Objection to form.</p> <p>9 THE WITNESS: Dynamic allocation</p> <p>10 I think was reimplemented by Google after its</p> <p>11 acquisition; in other words, they redesigned it</p> <p>12 and deployed it. I remember --</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. So it existed in DoubleClick for</p> <p>15 Publisher -- I'm sorry. Start over.</p> <p>16 Dynamic allocation existed in</p> <p>17 DoubleClick prior to the acquisition by Google.</p> <p>18 After the acquisition, Google made design</p> <p>19 changes.</p> <p>20 MR. WOLIN: Objection to form.</p> <p>21 THE WITNESS: My understanding is that</p> <p>22 they reimplemented the whole thing. They -- they</p> <p>23 just started from scratch and rebuilt that</p> <p>24 feature.</p> <p>25 BY MR. ISAACSON:</p>	<p style="text-align: right;">Page 124</p> <p>1 auctions.</p> <p>2 Q. I'm just referring to the phrase "The</p> <p>3 rise of header bidding in 2017." What rise of</p> <p>4 header bidding took place in 2017?</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: (Reviews document.)</p> <p>7 In Footnote 372 in Page 95, which</p> <p>8 explains some of the context leading up to</p> <p>9 Paragraph 195, there's an example of header</p> <p>10 bidding growing faster than AdX impressions in</p> <p>11 percentage in 2017, as reported in 2018.</p> <p>12 BY MR. ISAACSON:</p> <p>13 Q. All right. And then I think you've said</p> <p>14 this, but I just want to make sure, Paragraph 268</p> <p>15 of your opening report begins with the sentence,</p> <p>16 "Dynamic allocation was an existing feature of</p> <p>17 DoubleClick for Publisher when Google acquired</p> <p>18 DoubleClick in 2008."</p> <p>19 That was your -- that's a true</p> <p>20 statement, to your understanding, correct?</p> <p>21 A. Yes. 625, the footnote also verifies</p> <p>22 that.</p> <p>23 Q. All right. Now, you say -- at Paragraph</p> <p>24 71 of your report you refer to a preferential</p> <p>25 position -- positioning in bidding which AdX</p>
<p style="text-align: right;">Page 123</p> <p>1 Q. The header bidding, as I understand it,</p> <p>2 was not developed until around 2014-2015; is that</p> <p>3 right?</p> <p>4 A. 2014 would be about right.</p> <p>5 Q. Okay. And then at Paragraph 195 of your</p> <p>6 report, you refer to the rise of header bidding</p> <p>7 in 2017. What do you mean by "the rise of header</p> <p>8 bidding"?</p> <p>9 A. Its rapid adoption in those two years.</p> <p>10 Q. I don't know which two years you're</p> <p>11 referring to because there's the year 2017 there.</p> <p>12 A. We talked about the header bidding being</p> <p>13 introduced by publishers in 2014-15. So it would</p> <p>14 be those intervening two years.</p> <p>15 Q. Right. But when you say the rise of</p> <p>16 header bidding in 2017, what are you referring</p> <p>17 to?</p> <p>18 A. Could you point me to the paragraph</p> <p>19 again? Sorry.</p> <p>20 Q. Paragraph 195.</p> <p>21 A. 195.</p> <p>22 As I explained in the next sentence,</p> <p>23 I'm talking about the -- the strong correlation</p> <p>24 between the adoption of header bidding and the</p> <p>25 eventual move of ad exchanges to first-price</p>	<p style="text-align: right;">Page 125</p> <p>1 enjoyed through dynamic allocation.</p> <p>2 No. That's actually Paragraph 72.</p> <p>3 A. 72.</p> <p>4 Q. Yeah.</p> <p>5 A. Okay. Yes. I see that. Yeah.</p> <p>6 Q. And in this you say that, "Preferential</p> <p>7 position in bidding may have incentivized buyers</p> <p>8 to choose AdX over other exchanges," correct?</p> <p>9 A. That's what I wrote.</p> <p>10 Q. Right. And by "buyers," who were you</p> <p>11 referring to?</p> <p>12 A. The buyers that bid into the AdX</p> <p>13 auction.</p> <p>14 Q. Right. So through the technical design</p> <p>15 of dynamic allocation, Google was making itself</p> <p>16 more attractive to advertisers who wanted to bid</p> <p>17 on an ad exchange; is that right?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: I was pointing to the</p> <p>20 technical design of the Publisher ad server,</p> <p>21 which is DFP, which helped the ad exchange of</p> <p>22 Google, AdX, obtain more customers.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. All right. So, the technical design of</p> <p>25 the Publisher ad server, DFP, made Google more</p>

<p style="text-align: right;">Page 126</p> <p>1 attractive to advertisers who wanted to bid on an</p> <p>2 ad exchange; is that right?</p> <p>3 A. The --</p> <p>4 MR. WOLIN: Objection to form.</p> <p>5 THE WITNESS: The preferential position</p> <p>6 that DFP placed AdX in in its waterfall made</p> <p>7 Google's ad exchange more attractive to the</p> <p>8 buyers in exchanges.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. And the buyers in the exchanges are the</p> <p>11 advertisers who wanted to bid on ads, right?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: Among others who acted on</p> <p>14 their -- on their behalf.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. And that preferential position in</p> <p>17 bidding was an existing feature of DoubleClick</p> <p>18 for Publisher when Google acquired DoubleClick in</p> <p>19 2008, correct?</p> <p>20 MR. WOLIN: Objection to form.</p> <p>21 THE WITNESS: AdX and DFP were not under</p> <p>22 common ownership -- let me think about that.</p> <p>23 Let's -- I have to think through the</p> <p>24 -- the common ownership issues.</p> <p>25 The -- the position of AdX to be always</p>	<p style="text-align: right;">Page 128</p> <p>1 acquired by Google?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: I don't have enough</p> <p>4 knowledge in that matter. I'd have to go back</p> <p>5 and look at documents to see if that was the</p> <p>6 case.</p> <p>7 MR. WOLIN: When we get to a good spot,</p> <p>8 Bill, we're ready to take a break for lunch.</p> <p>9 MR. ISAACSON: Let me just do this</p> <p>10 quickly. If it takes long I'll bail.</p> <p>11 BY MR. ISAACSON:</p> <p>12 Q. The -- in order to eliminate this</p> <p>13 preferential feature that you're describing,</p> <p>14 Google would have had to redesign the DoubleClick</p> <p>15 technology it acquired to eliminate the product</p> <p>16 -- to eliminate that preference as a product</p> <p>17 feature. Am I correct about that?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: As we were saying, DFP had</p> <p>20 the waterfall before Google acquired it, and that</p> <p>21 waterfall did not have any preferential positions</p> <p>22 for any of the bidders into DFP.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. Are you -- do you know whether there was</p> <p>25 a preferential position prior to the acquisition</p>
<p style="text-align: right;">Page 127</p> <p>1 first in the DFP waterfall was something that was</p> <p>2 established and continued until 2019.</p> <p>3 BY MR. ISAACSON:</p> <p>4 Q. All right. Was it -- was it a product</p> <p>5 feature -- was pref -- the preferential position</p> <p>6 in bidding that you've described an existing</p> <p>7 feature of DoubleClick for Publisher when</p> <p>8 Google acquired DoubleClick in 2008?</p> <p>9 MR. WOLIN: Objection to form.</p> <p>10 THE WITNESS: I'm not exactly sure about</p> <p>11 this point, because my memory about AdX and DFP's</p> <p>12 acquisition of Google are -- I'll have to jog</p> <p>13 that memory.</p> <p>14 But the report points to how, in a</p> <p>15 traditional waterfall, the position in the</p> <p>16 waterfall is based on expected prices on that</p> <p>17 type of impression. The ordering is based on the</p> <p>18 price you expect to get. That's what the</p> <p>19 traditional waterfall design dictates.</p> <p>20 The preferential position here is AdX</p> <p>21 being first, irrespective of the historical</p> <p>22 prices it produced on those line items.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. All right. Do you deny that DoubleClick</p> <p>25 had that preferential position prior to being</p>	<p style="text-align: right;">Page 129</p> <p>1 by Google?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: Yeah. I'm not totally</p> <p>4 sure about AdX's, yeah. Mm-hmm.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. And if you assume there was a</p> <p>7 preferential position prior to the acquisition,</p> <p>8 in order to get rid of that, Google would have</p> <p>9 had to redesign the technology to get rid of that</p> <p>10 preference, right?</p> <p>11 MR. WOLIN: Objection to form.</p> <p>12 THE WITNESS: That is one of the things</p> <p>13 it could have done. There are many ways it could</p> <p>14 have proceeded.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. All right. You've been pointing to the</p> <p>17 effects on rivals of that preference. In order</p> <p>18 to get rid of that effect on rivals from that</p> <p>19 preference, if you assume that preference existed</p> <p>20 in DoubleClick for Publisher prior to</p> <p>21 acquisition, Google, upon acquiring it, would</p> <p>22 have had to redesign the system they acquired to</p> <p>23 get rid of that preference; is that correct?</p> <p>24 MR. WOLIN: Objection to form.</p> <p>25 THE WITNESS: There are two points</p>

<p style="text-align: right;">Page 130</p> <p>1 here. One is that the waterfall in DFP with</p> <p>2 AdX's preferential position made AdX the only</p> <p>3 exchange that always got to run a realtime</p> <p>4 auction on the impressions that DFP was</p> <p>5 supplying. That's the first point.</p> <p>6 The second is around 2010 we</p> <p>7 talked about OpenRTB, which was a technical</p> <p>8 specification for any exchange to bid into a</p> <p>9 publisher ad server. So that -- that is another</p> <p>10 way in which Google might have evaluated its</p> <p>11 technology.</p> <p>12 BY MR. ISAACSON:</p> <p>13 Q. All right. You're talking about a</p> <p>14 technical redesign that Google did do in 2010,</p> <p>15 and you're saying that, after acquiring</p> <p>16 DoubleClick for Publishers, they could have done</p> <p>17 that redesign then?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: Google did not support</p> <p>20 the 2010 OpenRTB. But one of the eight or so</p> <p>21 originators of that technical specification was</p> <p>22 AdMeld, which Google acquired.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. All right. Let me just get back to my</p> <p>25 question and see if I can get an answer.</p>	<p style="text-align: right;">Page 132</p> <p>1 how much work that involves?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: I couldn't tell you</p> <p>4 exactly.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. And is there some -- so after the</p> <p>7 acquisition in 2008, was there some time where</p> <p>8 Google needed to do that redesign in order to</p> <p>9 -- in order to eli -- in order to not have these</p> <p>10 harmful facts? How long did they -- how fast did</p> <p>11 they have to move?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: I do not have an opinion</p> <p>14 about that. I have not thought about it too</p> <p>15 deeply.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. Do you think they needed to move, like,</p> <p>18 virtually immed -- as -- as soon as the</p> <p>19 acquisition happened, did they need to start</p> <p>20 redesigning it to get rid of that re -- to get</p> <p>21 rid of that preferential position you described?</p> <p>22 MR. WOLIN: Objection to form.</p> <p>23 THE WITNESS: Again, I don't have an</p> <p>24 opinion about that timeline.</p> <p>25 MR. WOLIN: All right. Let's go off the</p>
<p style="text-align: right;">Page 131</p> <p>1 In order to get rid of the effect</p> <p>2 on rivals from the preference you've been</p> <p>3 describing, do you assume that preference</p> <p>4 existed in DoubleClick for Publisher, prior to</p> <p>5 acquisition, Google upon acquiring it would have</p> <p>6 had to redesign the system in some manner in</p> <p>7 order to get rid of that preference; is that</p> <p>8 correct?</p> <p>9 MR. WOLIN: Objection to form.</p> <p>10 THE WITNESS: If we assume that AdX had</p> <p>11 a preferential position before Google acquired</p> <p>12 DFP, some product changes would be necessary in</p> <p>13 DFP.</p> <p>14 BY MR. ISAACSON:</p> <p>15 Q. All right. And just in general when you</p> <p>16 talk about this preferential position, you have</p> <p>17 to redesign the product to get rid of that</p> <p>18 preferential position, right?</p> <p>19 MR. WOLIN: Objection to form.</p> <p>20 THE WITNESS: That's why I was pointing</p> <p>21 to OpenRTB. OpenRTB is an example of such a</p> <p>22 design.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. Right. And that takes some number of</p> <p>25 engineers and some amount of work. Do you know</p>	<p style="text-align: right;">Page 133</p> <p>1 record.</p> <p>2 THE VIDEOGRAPHER: Off the record at</p> <p>3 1:04.</p> <p>4 (Lunch recess taken.)</p> <p>5 THE VIDEOGRAPHER: Back on the record at</p> <p>6 1:45.</p> <p>7 BY MR. ISAACSON:</p> <p>8 Q. One of the conclusions in your report is</p> <p>9 you say that Google's preferential position in</p> <p>10 bidding incentivized buyers to choose AdX over</p> <p>11 rival exchanges because -- and that gave Google</p> <p>12 scale advantage. Is that generally --</p> <p>13 A. That is generally what I write in my</p> <p>14 report, yeah.</p> <p>15 Q. Right.</p> <p>16 Is it -- do you agree that anytime</p> <p>17 Google successfully designed AdX to incentivize</p> <p>18 buyers to choose AdX over its rivals that would</p> <p>19 give Google scale advantages?</p> <p>20 MR. WOLIN: Objection to form.</p> <p>21 THE WITNESS: When Google designed its</p> <p>22 products to advantage AdX in such a way that</p> <p>23 advertisers found -- and other buyers through AdX</p> <p>24 found it attractive, it attracted scale for AdX,</p> <p>25 yes.</p>

<p style="text-align: right;">Page 134</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. Right. Anytime Google designed AdX to</p> <p>3 be more attractive, that would give Google</p> <p>4 more -- AdX more scale.</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: I like that DFP made AdX</p> <p>7 more attractive for buyers through AdX because of</p> <p>8 its preferential position.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. That's not my question. My question</p> <p>11 is any time Google designed AdX to be move more</p> <p>12 attractive to buyers, that would give Google</p> <p>13 -- Google's AdX more scale, right.</p> <p>14 MR. WOLIN: Objection to form.</p> <p>15 THE WITNESS: Generally speaking, when</p> <p>16 a product is more attractive to its buyers, it</p> <p>17 attracts more participants, which is one measure</p> <p>18 of scale.</p> <p>19 BY MR. ISAACSON:</p> <p>20 Q. And to avoid giving Google scale</p> <p>21 advantages over its competitors, was it</p> <p>22 necessary for Google to design its system</p> <p>23 to not be attractive to buyers?</p> <p>24 MR. WOLIN: Objection to form.</p> <p>25 THE WITNESS: My opinion was not about</p>	<p style="text-align: right;">Page 136</p> <p>1 be less attractive to buyers, right?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: That was not in my</p> <p>4 opinion.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. Well, how else was Google going</p> <p>7 to avoid achieving scale to the disadvantage of</p> <p>8 its rivals other than designing less-attractive</p> <p>9 products?</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: There are many ways in</p> <p>12 which an ad tech product can be made attractive.</p> <p>13 I was calling out the specific preferences within</p> <p>14 Google's system that made some of them</p> <p>15 attractive.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. So some features that make a system</p> <p>18 attractive to buyers are okay in your mind, and</p> <p>19 some aren't?</p> <p>20 MR. WOLIN: Objection to form.</p> <p>21 THE WITNESS: I have no opinion about</p> <p>22 specific features and other specific features.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. All right. And returning to my</p> <p>25 question, can you name any way that Google</p>
<p style="text-align: right;">Page 135</p> <p>1 the attractiveness of Google's products. It</p> <p>2 was more about the preferencing of AdX by DFP,</p> <p>3 giving AdX this advantage and attractiveness to</p> <p>4 its buyers.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. Yes. The preferencing made AdX more</p> <p>7 attractive to buyers. That was your conclusion,</p> <p>8 correct?</p> <p>9 MR. WOLIN: Objection --</p> <p>10 THE WITNESS: Yes.</p> <p>11 MR. WOLIN: -- to form.</p> <p>12 THE WITNESS: Yes.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. If at any time AdX was made more</p> <p>15 attractive to buyers, then Google would gain</p> <p>16 scale and that would benefit it versus rivals,</p> <p>17 correct?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: As I was saying earlier,</p> <p>20 generally speaking, attractive products increase</p> <p>21 the scale.</p> <p>22 BY MR. ISAACSON:</p> <p>23 Q. Right. And -- and to avoid that</p> <p>24 happening and -- and to avoid disadvantaging</p> <p>25 rivals, Google would have to design its system to</p>	<p style="text-align: right;">Page 137</p> <p>1 could avoid achieve -- achieving scale to the</p> <p>2 disadvantage of its rivals other than designing a</p> <p>3 system less attractive to buyers?</p> <p>4 MR. WOLIN: Objection; form.</p> <p>5 THE WITNESS: Could you repeat the first</p> <p>6 phrase?</p> <p>7 BY MR. ISAACSON:</p> <p>8 Q. Can you name any way that Google could</p> <p>9 achieve -- well, I garbled that question too, so</p> <p>10 that didn't help.</p> <p>11 Well, no, I got it right.</p> <p>12 Can you name any way that Google</p> <p>13 could avoid gaining scale for itself to the</p> <p>14 disadvantage of its rivals other than designing a</p> <p>15 system less attractive to buyers?</p> <p>16 MR. WOLIN: Objection to form.</p> <p>17 THE WITNESS: Hmm. That is a quite</p> <p>18 contorted question there.</p> <p>19 Could I name any way in which Google</p> <p>20 could not disadvantage its rivals and build</p> <p>21 scale?</p> <p>22 BY MR. ISAACSON:</p> <p>23 Q. Yeah.</p> <p>24 A. More efficient conversion?</p> <p>25 Q. Well, no, no, no. Actually, that's not</p>

<p style="text-align: right;">Page 138</p> <p>1 the question.</p> <p>2 Could you name a way Google could not</p> <p>3 disadvantage and ri -- disadvantage its rivals</p> <p>4 and build scale other than producing a lower-qual</p> <p>5 -- a less-attractive product.</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: I'm sorry. I really did</p> <p>8 not get the implication here.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. So the implic -- I'm not trying to have</p> <p>11 implications here.</p> <p>12 You've said that -- that Google, by</p> <p>13 providing this preference, created something that</p> <p>14 was more attractive to buyers and builds scale;</p> <p>15 and that that disadvantaged rivals. And you said</p> <p>16 that, generally, if Google makes the product more</p> <p>17 attractive, that will build scale and</p> <p>18 disadvantage rivals.</p> <p>19 What I want to know, if you want to</p> <p>20 achieve the opposite result, if you want to not</p> <p>21 disadvantage rivals, or advantage rivals, okay,</p> <p>22 could you think of any way of doing that if</p> <p>23 you're Google other than designing a</p> <p>24 less-attractive product?</p> <p>25 MR. WOLIN: Objection to form.</p>	<p style="text-align: right;">Page 140</p> <p>1 would typically depend on the price the purchaser</p> <p>2 fetched.</p> <p>3 BY MR. ISAACSON:</p> <p>4 Q. All right. And it's the publisher that</p> <p>5 chose that price, correct?</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: It was the publisher or a</p> <p>8 system that was representing them by -- selling</p> <p>9 on their behalf.</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q. Right. And if the publ -- and also</p> <p>12 the publisher had the choice of not selecting by</p> <p>13 price; the publisher or their agent could name</p> <p>14 the order of exchanges in the waterfall.</p> <p>15 MR. WOLIN: Objection to form.</p> <p>16 THE WITNESS: That is a technical</p> <p>17 possibility.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q. And you agree that the waterfall was</p> <p>20 inefficient?</p> <p>21 MR. WOLIN: Objection to form.</p> <p>22 THE WITNESS: That is my opinion in the</p> <p>23 report.</p> <p>24 BY MR. ISAACSON:</p> <p>25 Q. All right. And -- and dynamic</p>
<p style="text-align: right;">Page 139</p> <p>1 THE WITNESS: I really did not consider</p> <p>2 deeply the various ways in which Google could not</p> <p>3 disadvantage rivals. I looked at the conducts</p> <p>4 as -- you know, as the evidence indicates, and I</p> <p>5 tried to opine on the -- the preferential</p> <p>6 treatment, for example, that I explained. I</p> <p>7 really did not get into thinking about ways of</p> <p>8 not disadvantaging rivals. That's --</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. All right. Thank you.</p> <p>11 Now, with regards to the waterfall,</p> <p>12 do you -- you agree that publishers set the order</p> <p>13 that exchanges were called in the waterfall?</p> <p>14 MR. WOLIN: Objection to form.</p> <p>15 THE WITNESS: In the traditional</p> <p>16 waterfall, that was generally true.</p> <p>17 BY MR. ISAACSON:</p> <p>18 Q. Yeah. I'm talking about the traditional</p> <p>19 waterfall right now.</p> <p>20 And under the traditional wat --</p> <p>21 waterfall, publishers would rank exchanges or</p> <p>22 other purchasers according to a priority,</p> <p>23 correct?</p> <p>24 MR. WOLIN: Objection to form.</p> <p>25 THE WITNESS: Yes. And the priority</p>	<p style="text-align: right;">Page 141</p> <p>1 allocation allowed AdX advertisers to compete for</p> <p>2 impressions simultaneously before the waterfall</p> <p>3 was run; is that correct?</p> <p>4 A. Dynamic allocation only allowed AdX</p> <p>5 buyers to compete simultaneously, not all buyers</p> <p>6 buying off of DFP.</p> <p>7 Q. Right. And so Google, through dynamic</p> <p>8 allocation, allowed the buyers on AdX, which is a</p> <p>9 Google product, to participate in a si -- in a si</p> <p>10 -- simultaneous competition for the impressions</p> <p>11 before the waterfall was run; is that correct?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: I wouldn't characterize</p> <p>14 it as "before the waterfall was run." AdX was</p> <p>15 the first in that waterfall order.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. And you think that first in the order is</p> <p>18 not before?</p> <p>19 A. First in the order is first in the</p> <p>20 order.</p> <p>21 Q. Yeah. Okay.</p> <p>22 The -- and -- and what you're saying is</p> <p>23 that if buyers were in exchanges that weren't</p> <p>24 Google products, they should have been in there</p> <p>25 at the same time as the Google customers.</p>

<p style="text-align: right;">Page 142</p> <p>1 MR. WOLIN: Objection to form.</p> <p>2 THE WITNESS: I don't have any opinion</p> <p>3 about that.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q. You don't have any opinion about</p> <p>6 that, but that is what you are saying was the</p> <p>7 preference. The preference was Google was giving</p> <p>8 a preference to its own customers and not giving</p> <p>9 a preference to customers working in -- in</p> <p>10 exchanges of its rivals.</p> <p>11 MR. WOLIN: Objection to form.</p> <p>12 THE WITNESS: I was pointing out the</p> <p>13 difference from the traditional waterfall where</p> <p>14 the ordering is based on historical prices.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. But the preference, sir, was to Google</p> <p>17 customers over customers of Google competitors,</p> <p>18 correct?</p> <p>19 MR. WOLIN: Objection to form.</p> <p>20 THE WITNESS: In this case, the</p> <p>21 preference was to AdX.</p> <p>22 BY MR. ISAACSON:</p> <p>23 Q. It was to Google customers in AdX,</p> <p>24 correct?</p> <p>25 MR. WOLIN: Objection to form.</p>	<p style="text-align: right;">Page 144</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. Right. So one of them was OpenX; one of</p> <p>3 them was PubMatic; another one was Google,</p> <p>4 correct?</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: I think that's about</p> <p>7 right, yeah.</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q. Now, in your discussion of header</p> <p>10 bidding, you discuss the prices that publishers</p> <p>11 who used header bidding would put into DFP.</p> <p>12 A. Yes, I do discuss that.</p> <p>13 Q. Okay. And if you look at your rebuttal</p> <p>14 report at Paragraph 47, it is correct that</p> <p>15 publishers got to choose what price to put into</p> <p>16 DFP following the header bidding auction.</p> <p>17 Correct?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: That's also generally</p> <p>20 correct, yes.</p> <p>21 BY MR. ISAACSON:</p> <p>22 Q. And you say that "Google documents</p> <p>23 suggest that publishers could, and sometimes did,</p> <p>24 inflate the header bids that they entered into</p> <p>25 DFP," correct?</p>
<p style="text-align: right;">Page 143</p> <p>1 THE WITNESS: It was to the buyers of</p> <p>2 impressions through AdX.</p> <p>3 BY MR. ISAACSON:</p> <p>4 Q. Right. And those are buyers who are</p> <p>5 Google customers in AdX, correct?</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: Those are the customers of</p> <p>8 AdX.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. All right. And you mentioned when AdX</p> <p>11 was relaunched, I think -- when -- after the</p> <p>12 acquisition by DoubleClick, Google relaunched</p> <p>13 AdX with real-time bidding, didn't it?</p> <p>14 MR. WOLIN: Objection to form.</p> <p>15 THE WITNESS: I think that's generally</p> <p>16 correct. I mentioned that somewhere.</p> <p>17 BY MR. ISAACSON:</p> <p>18 Q. Right. And there were a few companies</p> <p>19 during that period, 2008, 2009, 2010, who</p> <p>20 launched real-time bidding at about that -- that</p> <p>21 time period. There was a handful of companies,</p> <p>22 including Google, that did that, right?</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: That's generally correct,</p> <p>25 yeah.</p>	<p style="text-align: right;">Page 145</p> <p>1 A. That's generally correct. But I point</p> <p>2 out in the rest of the sentence that Google did</p> <p>3 not know how often they did that.</p> <p>4 Q. Correct. And that's what I was about to</p> <p>5 get to.</p> <p>6 So have you done any investigation as</p> <p>7 to how often publishers inflated header bids that</p> <p>8 they put into DFP, as opposed to putting in as a</p> <p>9 reserve the result of the header bid auction.</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: The documentary evidence</p> <p>12 I've seen particularly about the implementation</p> <p>13 of header bidding through Google's infrastructure</p> <p>14 suggests that publishers did use, mostly, the</p> <p>15 header bidding price that they fetched outside.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. You're saying that you've seen that in a</p> <p>18 document?</p> <p>19 A. In several documents describing those</p> <p>20 implementations.</p> <p>21 Q. All right. The -- and you were relying</p> <p>22 on those documents for your conclusion about</p> <p>23 that?</p> <p>24 MR. WOLIN: Objection to form.</p> <p>25 THE WITNESS: Additionally, I also cite</p>

<p style="text-align: right;">Page 162</p> <p>1 Q. And what you have said is that Google</p> <p>2 -- while that's not what Google launched, Google</p> <p>3 explored applying Project Bell to passback</p> <p>4 publishers, correct?</p> <p>5 A. Yes. I have written that Google</p> <p>6 explored.</p> <p>7 Q. All right. And so what you found</p> <p>8 through reviewing Google documents was that</p> <p>9 Google knew how to disadvantage passback</p> <p>10 mediation, but it did not go forward and do that,</p> <p>11 correct?</p> <p>12 MR. WOLIN: Objection; form.</p> <p>13 THE WITNESS: The Google documents that</p> <p>14 I reviewed and I cite here describe the design</p> <p>15 of experiments of identifying these passback</p> <p>16 publishers and doing what is called unconstrained</p> <p>17 pool-building. That's getting as much subsidies,</p> <p>18 if you will, from these publishers and using them</p> <p>19 on non-passback publishers called first-call</p> <p>20 publishers.</p> <p>21 In fact, the name Project Bell owes its</p> <p>22 origin to the person who made the first call in</p> <p>23 a -- in a sort of allusion to this distinction</p> <p>24 between first-call versus passback.</p> <p>25 BY MR. ISAACSON:</p>	<p style="text-align: right;">Page 164</p> <p>1 that came out before it named Project Bell,</p> <p>2 insinuating the distinction between first-call</p> <p>3 and passback publishers. And I saw the</p> <p>4 experiments that they ran on 20 publishers.</p> <p>5 And then I -- I do see that in the fully launched</p> <p>6 version, V2, in 2016, two years after these</p> <p>7 experiments were run, the program only applied to</p> <p>8 the multi-call mediators.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. So I'm concerned that -- and I know</p> <p>11 you're trying to explain this -- that a Court's</p> <p>12 not going to understand what you're saying; so</p> <p>13 I'm going to go over this again, because I just</p> <p>14 want to get down to the simple point Google did</p> <p>15 conduct experiments which gave them information</p> <p>16 about how they could possibly impair passback</p> <p>17 mediation, correct?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: The experiments actually</p> <p>20 carried out the application of this optimization</p> <p>21 on the experimented publishers, and from that</p> <p>22 it -- it concluded that it would be effective,</p> <p>23 yeah.</p> <p>24 BY MR. ISAACSON:</p> <p>25 Q. Okay. So Google did experiments showing</p>
<p style="text-align: right;">Page 163</p> <p>1 Q. And through those experiments, Google</p> <p>2 learned how it could disadvantage passback</p> <p>3 mediation, but it did not go forward with that,</p> <p>4 correct?</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: I've only seen evidence</p> <p>7 of these experiments where it explored and</p> <p>8 understood the effects of this exploration.</p> <p>9 I've not seen a fully launched version in my</p> <p>10 examination of disadvantaging passback mediation.</p> <p>11 BY MR. ISAACSON:</p> <p>12 Q. A fully -- you haven't seen a fully</p> <p>13 launched version of what?</p> <p>14 A. Of a -- a version of some version of</p> <p>15 Project Bell that disadvantaged passback</p> <p>16 publishers.</p> <p>17 Q. So what you saw was that Google</p> <p>18 conducted experiments that -- that helped them</p> <p>19 to understand how they might build a system to</p> <p>20 disadvantage passback mediation, and then Google</p> <p>21 went forward with Project Bell Version 2 which</p> <p>22 did not do that, correct?</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: What I saw was a</p> <p>25 modification of its buy-side DRS products</p>	<p style="text-align: right;">Page 165</p> <p>1 a method that would be effective impairing --</p> <p>2 impairing passback mediation. But when it went</p> <p>3 forward with Project Bell, it did not implement</p> <p>4 any impairments on passback mediation, correct?</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: Google implemented the</p> <p>7 experiments on passback mediation, but I have not</p> <p>8 seen a fully launched version disadvantaging</p> <p>9 passback publishers in Project Bell Version 2 in</p> <p>10 2016.</p> <p>11 BY MR. ISAACSON:</p> <p>12 Q. Now, the other feature that you just</p> <p>13 mentioned was -- has to do with multi-call.</p> <p>14 Now, multi-calling is a practice in</p> <p>15 which publishers fish for better prices by</p> <p>16 calling AdX multiple times, right?</p> <p>17 MR. WOLIN: Objection to form.</p> <p>18 THE WITNESS: That is the context in</p> <p>19 which I've encountered it.</p> <p>20 BY MR. ISAACSON:</p> <p>21 Q. And when publishers call AdX multiple</p> <p>22 times, they gradually lower their asking price</p> <p>23 until they submit a price for just below the</p> <p>24 highest bid. Isn't that generally the way it</p> <p>25 works?</p>

<p style="text-align: right;">Page 166</p> <p>1 MR. WOLIN: Objection to form.</p> <p>2 THE WITNESS: That's, roughly speaking,</p> <p>3 how it works. These multiple calls may have</p> <p>4 different sets of buyers, so it may not be</p> <p>5 exactly the same.</p> <p>6 BY MR. ISAACSON:</p> <p>7 Q. Right. And the objective of</p> <p>8 multi-calling was price inflation, right? It was</p> <p>9 a price inflation tactic.</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: It's characterized as</p> <p>12 "price fishing," which means fishing for the best</p> <p>13 price that they could fetch.</p> <p>14 BY MR. ISAACSON:</p> <p>15 Q. Right. But the -- it was also described</p> <p>16 as a price inflation tactic, right?</p> <p>17 MR. WOLIN: Objection to form.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q. Maybe if you look at Footnote 256 of</p> <p>20 your report, at Paragraph 128.</p> <p>21 A. Yes. That's how the Google document</p> <p>22 characterizes it: Price inflation tactics by</p> <p>23 publishers and exchanges.</p> <p>24 Q. And you don't deny that multi-calling</p> <p>25 as a practice would tend to raise prices for</p>	<p style="text-align: right;">Page 168</p> <p>1 Q. And would you agree with the statement</p> <p>2 that bidding for an impression is costly?</p> <p>3 MR. WOLIN: Objection to form.</p> <p>4 THE WITNESS: Bidding for an impression,</p> <p>5 including deciding how much that bid should be,</p> <p>6 is part of the cost of engaging in buying.</p> <p>7 BY MR. ISAACSON:</p> <p>8 Q. And would you agree with the statement</p> <p>9 that screening for the right impressions by</p> <p>10 bidders takes up valuable computing resources?</p> <p>11 MR. WOLIN: Objection to form.</p> <p>12 THE WITNESS: Again, generally speaking,</p> <p>13 finding the right set of buyers to choose in an</p> <p>14 auction is -- it takes some effort.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. And you would agree that multi-calling</p> <p>17 was harmful to advertisers, correct?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: Multi-calling was mainly</p> <p>20 a concern for publishers in terms of trying to</p> <p>21 find the best price that they could for the</p> <p>22 impressions.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. That wasn't my question.</p> <p>25 Do you agree multi-calling was harmful</p>
<p style="text-align: right;">Page 167</p> <p>1 advertisers, do you?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: Generally speaking, that</p> <p>4 would be the case.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. Right. And you're aware that</p> <p>7 multi-calling also raises costs for advertisers</p> <p>8 by creating multiple redundant queries that are</p> <p>9 not valuable for the advertiser to have to sort</p> <p>10 through?</p> <p>11 MR. WOLIN: Objection to form.</p> <p>12 THE WITNESS: It does increase the</p> <p>13 work involved by having many calls for the same</p> <p>14 impression. So in that sense it would be costly</p> <p>15 for everyone involved in processing that</p> <p>16 information.</p> <p>17 BY MR. ISAACSON:</p> <p>18 Q. All right. Would you agree with the</p> <p>19 statement that choosing for which request to</p> <p>20 compete is an economically significant cost for a</p> <p>21 bidder?</p> <p>22 MR. WOLIN: Objection to form.</p> <p>23 THE WITNESS: Generally speaking, that</p> <p>24 is true.</p> <p>25 BY MR. ISAACSON:</p>	<p style="text-align: right;">Page 169</p> <p>1 to advertisers?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: Inasmuch as the additional</p> <p>4 load that we just talked about that these</p> <p>5 multiple calls imposes on the ad tech system,</p> <p>6 multi-calling was generally not useful for the</p> <p>7 whole system.</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q. So -- and that's a fair point.</p> <p>10 It wasn't just -- multi-calling was not</p> <p>11 just harmful to advertisers. It was harmful to</p> <p>12 the whole ad tech system, correct?</p> <p>13 MR. WOLIN: Objection to form.</p> <p>14 THE WITNESS: Multi-calling as an</p> <p>15 effort by publishers to find the best price for</p> <p>16 themselves through the so-called "price fishing"</p> <p>17 did include additional load on all the systems</p> <p>18 involved in processing that impression.</p> <p>19 BY MR. ISAACSON:</p> <p>20 Q. Right. And that was generally not good</p> <p>21 for the whole ad tech system, correct?</p> <p>22 MR. WOLIN: Objection to form.</p> <p>23 THE WITNESS: In general, multi-calling</p> <p>24 introduced redundancies in the ad tech ecosystem.</p> <p>25 BY MR. ISAACSON:</p>

<p style="text-align: right;">Page 182</p> <p>1 integrated data mining and analytical decision</p> <p>2 tools in software in order to understand</p> <p>3 customers.</p> <p>4 MR. WOLIN: Objection to form.</p> <p>5 THE WITNESS: Yes. We were doing</p> <p>6 that with the example of customer relationship</p> <p>7 management systems, like Salesforce, which was</p> <p>8 the other example.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q. Right. And then in the next paragraph</p> <p>11 you say, CCM, which is -- what did we say CCM?</p> <p>12 A. The title of the book.</p> <p>13 "Customer-Centric Marketing."</p> <p>14 Q. Thank you.</p> <p>15 "The Customer-Centric Marketing</p> <p>16 decision-making paradigm calls for even more</p> <p>17 advanced software applications that integrate</p> <p>18 data mining and analytical decision tools more</p> <p>19 seamlessly." In other words, you need software</p> <p>20 and software applications that are going to run</p> <p>21 seamlessly and work together, right?</p> <p>22 MR. WOLIN: Objection to form.</p> <p>23 THE WITNESS: The main point of this</p> <p>24 sentence is the integration of data mining and --</p> <p>25 BY MR. ISAACSON:</p>	<p style="text-align: right;">Page 184</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. The more scale you have, the better</p> <p>3 you're gonna be able to serve these customers.</p> <p>4 MR. WOLIN: Objection to form.</p> <p>5 THE WITNESS: The more scale you have,</p> <p>6 you are able to improve the accuracy of these</p> <p>7 data mining tools, which then, integrated with</p> <p>8 decision making tools, also make better</p> <p>9 decisions.</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q. All right. Let's move to the topic of</p> <p>12 dynamic -- sell-side dynamic revenue share.</p> <p>13 Okay?</p> <p>14 And this is where -- just generally</p> <p>15 you'll recall just so you're oriented about our</p> <p>16 topic, Transactions -- the revenue share was</p> <p>17 being modified in different transactions. And</p> <p>18 you go through more specifics. I just wanted you</p> <p>19 oriented to topic.</p> <p>20 A. Yeah. And that's true of both the</p> <p>21 buy-side and sell-side revenue share adjustments.</p> <p>22 Q. Okay. Do you agree that sell-side</p> <p>23 dynamic revenue share could increase matches</p> <p>24 between advertisers and publishers that would</p> <p>25 cause AdX bidders to clear floor price in an</p>
<p style="text-align: right;">Page 183</p> <p>1 Q. Well, I'm --</p> <p>2 MR. WOLIN: Let him finish the answer,</p> <p>3 please.</p> <p>4 MR. ISAACSON: No. I would like him to</p> <p>5 answer the question.</p> <p>6 BY MR. ISAACSON:</p> <p>7 Q. So I didn't ask you what the main point</p> <p>8 of the sentence is. What I want to know is you</p> <p>9 -- based on what you write here about "the need</p> <p>10 for integrated data mining and analytical</p> <p>11 decision tools acting seamlessly," do you agree</p> <p>12 that you need those things to -- to work</p> <p>13 seamlessly and work together in order to get</p> <p>14 this -- to process this data and get the</p> <p>15 information that you want people to have?</p> <p>16 MR. WOLIN: Objection to form.</p> <p>17 THE WITNESS: We advocate the</p> <p>18 integration of data mining and decision-making</p> <p>19 tools.</p> <p>20 BY MR. ISAACSON:</p> <p>21 Q. Right. And that requires more scale and</p> <p>22 more data, right?</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: Generally speaking, more</p> <p>25 scale is helpful in these practices.</p>	<p style="text-align: right;">Page 185</p> <p>1 auction, a floor price that would not otherwise</p> <p>2 have been met?</p> <p>3 MR. WOLIN: Objection to form.</p> <p>4 THE WITNESS: Generally speaking, that</p> <p>5 is the case.</p> <p>6 BY MR. ISAACSON:</p> <p>7 Q. Okay. Do you agree that sell-side</p> <p>8 dynamic revenue share can expand output if it is</p> <p>9 used when it causes AdX bidders to clear floor</p> <p>10 price in an auction, a floor price that would not</p> <p>11 have otherwise have been met?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: Floor prices that</p> <p>14 are cleared by sell-side DRS that would not</p> <p>15 otherwise have been cleared does expand the</p> <p>16 output of AdX.</p> <p>17 BY MR. ISAACSON:</p> <p>18 Q. And do you understand -- understand</p> <p>19 output to be a term used in economics and</p> <p>20 antitrust economics?</p> <p>21 MR. WOLIN: Objection to form.</p> <p>22 THE WITNESS: I was understanding output</p> <p>23 here simply to be the total number of cleared</p> <p>24 transactions.</p> <p>25 BY MR. ISAACSON:</p>

<p style="text-align: right;">Page 186</p> <p>1 Q. Okay. The -- by the way, do you</p> <p>2 consider yourself an expert in industrial</p> <p>3 organization?</p> <p>4 A. I'm not an expert in IO.</p> <p>5 Q. Is it your view that dynamic revenue</p> <p>6 share did not increase output?</p> <p>7 MR. WOLIN: Objection to form.</p> <p>8 THE WITNESS: And how are you meaning</p> <p>9 "output" in this question?</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q. However you want to mean "output."</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: So the question would be?</p> <p>14 BY MR. ISAACSON:</p> <p>15 Q. Is it your view that sell-side dynamic</p> <p>16 revenue share did not increase output?</p> <p>17 MR. WOLIN: Objection to form.</p> <p>18 THE WITNESS: My view is that sell-side</p> <p>19 dynamic revenue sharing sometimes increase the</p> <p>20 volume of impressions won by AdX.</p> <p>21 BY MR. ISAACSON:</p> <p>22 Q. Okay. And so it would not be your</p> <p>23 -- you don't have an opinion that sell-side</p> <p>24 dynamic revenue share did not increase output?</p> <p>25 MR. WOLIN: Objection to form.</p>	<p style="text-align: right;">Page 188</p> <p>1 MR. WOLIN: Objection to form.</p> <p>2 THE WITNESS: That -- that is generally</p> <p>3 the case, as well, yeah.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q. All right. And did you see documents</p> <p>6 -- Google documents that indicated that sell-side</p> <p>7 dynamic revenue share increased publisher</p> <p>8 revenues from AdX?</p> <p>9 MR. WOLIN: Objection to form.</p> <p>10 THE WITNESS: In general, sell-side</p> <p>11 dynamic revenue sharing increased the portion</p> <p>12 that was sold through AdX.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. And did that increase publisher revenue</p> <p>15 on AdX?</p> <p>16 MR. WOLIN: Objection to form.</p> <p>17 THE WITNESS: That may have been the</p> <p>18 case. Part of the revenue may have been coming</p> <p>19 from a different source prior to.</p> <p>20 BY MR. ISAACSON:</p> <p>21 Q. All right. And did you see documents</p> <p>22 -- Google documents indicating that publishers</p> <p>23 on AdX were benefiting from sell-side dynamic</p> <p>24 revenue share through increased revenues?</p> <p>25 MR. WOLIN: Objection to form.</p>
<p style="text-align: right;">Page 187</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. There's a double-negative in there, but</p> <p>3 the -- so I can try it again, but I think you</p> <p>4 know where I'm going.</p> <p>5 Would you state an opinion -- would you</p> <p>6 have an opinion today that sell-side dynamic</p> <p>7 revenue share did not increase output?</p> <p>8 MR. WOLIN: Objection to form.</p> <p>9 THE WITNESS: No, I do not have an</p> <p>10 opinion about that.</p> <p>11 BY MR. ISAACSON:</p> <p>12 Q. All right. And have you seen documents</p> <p>13 showing that -- Google documents showing that dyn</p> <p>14 -- that sell-side dynamic revenue share increased</p> <p>15 -- increased the overall match rate for AdX</p> <p>16 publishers?</p> <p>17 MR. WOLIN: Objection to form.</p> <p>18 THE WITNESS: My general recollection</p> <p>19 is that is the case; that there were additional</p> <p>20 transactions cleared.</p> <p>21 BY MR. ISAACSON:</p> <p>22 Q. All right. And you did not see any</p> <p>23 document that indicated to you that sell-side</p> <p>24 dynamic revenue share did not increase the</p> <p>25 overall match rate, correct?</p>	<p style="text-align: right;">Page 189</p> <p>1 THE WITNESS: There may have been</p> <p>2 documents like that. I'll have to look at the</p> <p>3 appendix, perhaps.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q. Okay. And you did not see any Google</p> <p>6 documents that said that publishers on AdX were</p> <p>7 losing revenues as a result of sell-side dynamic</p> <p>8 revenue share, correct?</p> <p>9 MR. WOLIN: Objection to form.</p> <p>10 THE WITNESS: Yeah. I'm not finding</p> <p>11 any documents that talk about publisher revenue</p> <p>12 changes.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. By the way, how did you go about looking</p> <p>15 for documents for your report?</p> <p>16 A. I -- I tried -- I first read the</p> <p>17 complaint, and I narrowed in on the conducts</p> <p>18 and the ones that involved these optimization</p> <p>19 problems associated with them. And then I -- I</p> <p>20 requested documents, particularly design and</p> <p>21 technical documents that would explain these</p> <p>22 conducts.</p> <p>23 Q. And was that from the 12 people at the</p> <p>24 Brattle Group working with you?</p> <p>25 A. Before they were engaged, I was doing</p>

Page 190	Page 192
<p>1 this on my own with my contacts at DOJ. Later</p> <p>2 they did help me with that, yeah.</p> <p>3 Q. Now, your report expresses the</p> <p>4 opinion that sell-side dynamic revenue share</p> <p>5 disadvantaged rival ad exchanges. Is it your</p> <p>6 view that Google -- even if sell-side dynamic</p> <p>7 revenue share was increasing matches between</p> <p>8 advertisers and publishers, even if it was</p> <p>9 creating more money for publishers, that</p> <p>10 sell-side dynamic revenue share should not have</p> <p>11 gone forward because it was disadvantaging</p> <p>12 Google's rivals?</p> <p>13 MR. WOLIN: Objection to form.</p> <p>14 THE WITNESS: I don't have an opinion</p> <p>15 about whether it should or should not have gone</p> <p>16 forward.</p> <p>17 BY MR. ISAACSON:</p> <p>18 Q. Well, when you say that sell-side DRS,</p> <p>19 Dynamic Revenue Share, disadvantaged rivals, you</p> <p>20 are saying that it disadvantaged rivals at the</p> <p>21 same time as you acknowledge it did increase</p> <p>22 match rates between advertisers and publishers</p> <p>23 and did increase publisher revenues, correct.</p> <p>24 MR. WOLIN: Objection to form.</p> <p>25 THE WITNESS: I was pointing out the</p>	<p>1 share without reducing their average fees due to</p> <p>2 a lack of scale."</p> <p>3 Do you remember -- generally remember</p> <p>4 that topic?</p> <p>5 A. I remember that with respect to</p> <p>6 sell-side dynamic revenue share.</p> <p>7 Q. Yeah. Yeah. We're still on sell-side.</p> <p>8 A. Okay.</p> <p>9 Q. Now, you did not do any investigation</p> <p>10 about the specific sizes or scale of any rival</p> <p>11 exchanges to AdX, correct?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: I did not undertake a</p> <p>14 quantification of the -- the reduction in scale.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. You don't know the scale, for example,</p> <p>17 of any rival exchange to AdX?</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: Generally speaking, I know</p> <p>20 that AdX had about 60 percent of the market. I</p> <p>21 cite it somewhere. And so that already makes</p> <p>22 every other rival smaller than it.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. But in terms of the amount of data that</p> <p>25 rivals have, you don't know what scale of data</p>
Page 191	Page 193
<p>1 disadvantage to the rivals while also citing to</p> <p>2 the changes in publisher revenue when</p> <p>3 appropriate.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q. And the changes in publisher revenue</p> <p>6 that you're just referring to are increases in</p> <p>7 publisher revenue, correct?</p> <p>8 A. That was generally the case, yeah.</p> <p>9 Q. Right. And -- all right.</p> <p>10 MR. WOLIN: Can we take a break if</p> <p>11 you're at a good spot?</p> <p>12 MR. ISAACSON: Sure.</p> <p>13 MR. WOLIN: We've been going for over an</p> <p>14 hour.</p> <p>15 MR. ISAACSON: That's fine.</p> <p>16 MR. WOLIN: Let's go off the record.</p> <p>17 THE VIDEOGRAPHER: We're off the record</p> <p>18 at 2:54.</p> <p>19 (Recess taken.)</p> <p>20 THE VIDEOGRAPHER: Back on the record at</p> <p>21 3:07.</p> <p>22 BY MR. ISAACSON:</p> <p>23 Q. Now, in your opening report, you say</p> <p>24 that "Rival exchanges have not been able to</p> <p>25 implement similar features to dynamic revenue</p>	<p>1 any rival of -- of AdX had, correct?</p> <p>2 MR. WOLIN: Objection to form.</p> <p>3 THE WITNESS: Again, using that</p> <p>4 60-person number and an estimate of the daily</p> <p>5 impressions cleared, one could fathom an</p> <p>6 estimate.</p> <p>7 BY MR. ISAACSON:</p> <p>8 Q. But you've not looked at any specific</p> <p>9 rival exchange to see how much data they have?</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: I have not examined</p> <p>12 specific rivals' data in this case.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. And you don't know any rival exchange</p> <p>15 that has not been able to implement a program</p> <p>16 like sell-side dynamic revenue share due to</p> <p>17 limits on their scale.</p> <p>18 MR. WOLIN: Objection to form.</p> <p>19 THE WITNESS: I cite deposition</p> <p>20 testimony from one rival that I remember.</p> <p>21 BY MR. ISAACSON:</p> <p>22 Q. Yes, you do. That's Paragraph 162, Note</p> <p>23 341, --</p> <p>24 A. Thank you.</p> <p>25 Q. -- and that's [REDACTED]. And that</p>

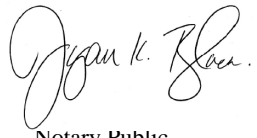
<p style="text-align: right;">Page 206</p> <p>1 is correct, yeah.</p> <p>2 BY MR. ISAACSON:</p> <p>3 Q. And what do you mean by a "clean</p> <p>4 second-price auction"?</p> <p>5 A. A clean second-price auction is one</p> <p>6 that prices the value of the impressions sold,</p> <p>7 according to the rules of a second-price auction;</p> <p>8 namely, the floor or the second-highest bidder,</p> <p>9 whichever was higher.</p> <p>10 Q. Right. And the -- and if it's not a</p> <p>11 clean second-price auction, are those sometimes</p> <p>12 referred to as dirty auctions?</p> <p>13 MR. WOLIN: Objection to form.</p> <p>14 THE WITNESS: You could call it that,</p> <p>15 just as a manner of speaking.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q. Okay. And what Poirot did was run</p> <p>18 experiments on traffic to determine an amount by</p> <p>19 which bids should be reduced in second-price</p> <p>20 auctions that were not clean, that were</p> <p>21 due -- that were dirty, right?</p> <p>22 MR. WOLIN: Objection to form.</p> <p>23 THE WITNESS: Poirot determined shading</p> <p>24 amounts for exchanges that were not running these</p> <p>25 clean second-price auctions, correct.</p>	<p style="text-align: right;">Page 208</p> <p>1 Q. And DV360 didn't alter bids in exchanges</p> <p>2 that ran clean second-price auctions.</p> <p>3 MR. WOLIN: Objection to form.</p> <p>4 THE WITNESS: To the extent that it</p> <p>5 could determine that the auction was clean.</p> <p>6 BY MR. ISAACSON:</p> <p>7 Q. Right. And the second-price auction</p> <p>8 that was not clean was an auction that called</p> <p>9 itself second-price, but really functioned at</p> <p>10 least somewhat like a first-price auction,</p> <p>11 correct?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: That could be one of the</p> <p>14 sources of uncleanness.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. All right. And you agree that Google</p> <p>17 developed Project Poirot again with evolving</p> <p>18 versions?</p> <p>19 A. Yes. We -- we see versions here of</p> <p>20 this.</p> <p>21 Q. And the initial version of Project</p> <p>22 Poirot launched in July 2017, correct?</p> <p>23 A. That sounds about right.</p> <p>24 Q. And after that there were several</p> <p>25 versions as Google continued to work on it.</p>
<p style="text-align: right;">Page 207</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. And just for other people, "shading"</p> <p>3 sounds shady itself. Shading just means you're</p> <p>4 adjusting your bidding, right?</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: Shading in the sense of a</p> <p>7 factor of less than one, --</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q. Right.</p> <p>10 A. -- that would be shading, like, versus</p> <p>11 boosting. I think that's where that language</p> <p>12 comes from.</p> <p>13 Q. There's nothing negative about shading</p> <p>14 just as a term --</p> <p>15 MR. WOLIN: Ob --</p> <p>16 THE WITNESS: Not at all. It has</p> <p>17 nothing to do with light either, yeah.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q. And so DV360 altered bids in exchanges</p> <p>20 that ran what could be called "dirty auctions."</p> <p>21 MR. WOLIN: Objection to form.</p> <p>22 THE WITNESS: DV360 perform this bid</p> <p>23 shading on auctions that were not running clean</p> <p>24 second-price auctions.</p> <p>25 BY MR. ISAACSON:</p>	<p style="text-align: right;">Page 209</p> <p>1 A. Yes. I do remember that.</p> <p>2 Q. All right. And, you know, for example,</p> <p>3 you could look at your report at Page 352 -- I</p> <p>4 mean -- not Page 352 -- I mean, Paragraph 352 in</p> <p>5 May 2018 Google developed a version of Poirot for</p> <p>6 private auctions?</p> <p>7 A. It extended the program, so it also</p> <p>8 included the private auctions.</p> <p>9 Q. All right. And in Paragraphs 355 in</p> <p>10 September 2018, Google updated Project Poirot so</p> <p>11 that you could take into account how auctions</p> <p>12 self-identified themselves?</p> <p>13 A. That's correct. The type of auction</p> <p>14 format was one of the features that was</p> <p>15 incorporated in that version, yeah.</p> <p>16 Q. Right. Okay. And -- so and you agreed</p> <p>17 that Project Poirot applied to exchanges that</p> <p>18 deviated from second-pricing.</p> <p>19 MR. WOLIN: Objection to form.</p> <p>20 THE WITNESS: Project Poirot applied to</p> <p>21 exchanges that were experimentally verified to be</p> <p>22 deviated from second-pricing.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. And those are the "not-clean" or "dirty</p> <p>25 auctions"?</p>

<p style="text-align: right;">Page 210</p> <p>1 MR. WOLIN: Objection to form.</p> <p>2 THE WITNESS: That's how they're</p> <p>3 characterized in these documents.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q. Yes. And are you aware of Google</p> <p>6 documents that showed that advertisers increased</p> <p>7 their surplus as a result of Project Poirot?</p> <p>8 MR. WOLIN: Objection to form.</p> <p>9 THE WITNESS: I believe there are some</p> <p>10 experiments that show the increase in advertiser</p> <p>11 surplus.</p> <p>12 BY MR. ISAACSON:</p> <p>13 Q. Right. And are you aware that there are</p> <p>14 Google documents that show that Poirot increased</p> <p>15 advertiser conversions per dollar on exchanges?</p> <p>16 MR. WOLIN: Objection to form.</p> <p>17 THE WITNESS: I believe there could be</p> <p>18 documents like that.</p> <p>19 BY MR. ISAACSON:</p> <p>20 Q. Are you aware of any documents that</p> <p>21 would dispute that Poirot benefited advertisers</p> <p>22 by increasing their conversions and increases</p> <p>23 their conversions per -- per dollar?</p> <p>24 MR. WOLIN: Objection to form.</p> <p>25 THE WITNESS: In general, Poirot</p>	<p style="text-align: right;">Page 212</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. All right. And bid shading programs</p> <p>3 like Poirot are needed -- when facing auctions</p> <p>4 that don't run second-price auctions, they're</p> <p>5 needed about the ecosystem -- for the healthy</p> <p>6 ad tech ecosystem, correct?</p> <p>7 MR. WOLIN: Objection to form.</p> <p>8 THE WITNESS: They're mainly needed by</p> <p>9 the bidders into this auction -- these unclean</p> <p>10 auctions.</p> <p>11 BY MR. ISAACSON:</p> <p>12 Q. Right. The risk is that the bidders</p> <p>13 are going to bid not knowing the truth about the</p> <p>14 exchange they're bidding into, right?</p> <p>15 MR. WOLIN: Objection to form.</p> <p>16 THE WITNESS: They could determine, like</p> <p>17 the experiments that were used to apply Poirot</p> <p>18 to, the nature of the auctions that they were</p> <p>19 bidding in.</p> <p>20 BY MR. ISAACSON:</p> <p>21 Q. Right. But if bidders have to run</p> <p>22 experiments themselves to determine whether an</p> <p>23 auction is clean, that's not good for a healthy</p> <p>24 ad tech ecosystem, is it?</p> <p>25 MR. WOLIN: Objection to form.</p>
<p style="text-align: right;">Page 211</p> <p>1 documents and experiments show a -- an increase</p> <p>2 in surplus for some of the advertisers.</p> <p>3 BY MR. ISAACSON:</p> <p>4 Q. And you agreed that by increasing</p> <p>5 surplus Poirot was benefiting advertisers?</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: Generally speaking, these</p> <p>8 bid shading programs are aimed at increasing the</p> <p>9 surplus of these advertisers, and that's borne</p> <p>10 out in some of the experiments.</p> <p>11 BY MR. ISAACSON:</p> <p>12 Q. Right. And because the -- Poirot was</p> <p>13 aimed at these auctions that were not clean, or</p> <p>14 "dirty," would you agree that Project Poirot was</p> <p>15 also aimed at improving the ecosystem as a whole.</p> <p>16 MR. WOLIN: Objection to form.</p> <p>17 BY MR. ISAACSON:</p> <p>18 Q. The ad tech ecosystem?</p> <p>19 MR. WOLIN: Same objection.</p> <p>20 THE WITNESS: Bid shading programs</p> <p>21 like Poirot are -- are needed when facing</p> <p>22 auctions that don't run second-price auctions.</p> <p>23 So in that sense, programs like Poirot are</p> <p>24 necessary to develop strategies for such</p> <p>25 auctions.</p>	<p style="text-align: right;">Page 213</p> <p>1 THE WITNESS: In general, it would be</p> <p>2 better to know the auction format that you're</p> <p>3 bidding into. That would save a -- a lot of</p> <p>4 trouble.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. All right. Now, you say that Google's</p> <p>7 initial purchase with Poirot were overly-simple</p> <p>8 and did not reduce bids optimally, right?</p> <p>9 A. Yes, I remember.</p> <p>10 Q. And when you say "the initial approaches</p> <p>11 with Poirot did not reduce bids optimally," what</p> <p>12 do you mean by "optimally"?</p> <p>13 A. So in the context of Poirot, when we</p> <p>14 look at an impression that's coming up for sale</p> <p>15 in one of these not-clean, second-price auctions,</p> <p>16 how should we determine how much we should shade</p> <p>17 the bid by? That -- that is the question that</p> <p>18 Poirot and other bid shading programs address.</p> <p>19 Typically, the amount of shading you</p> <p>20 would perform depends on the competition. If</p> <p>21 there's vigorous competition, you would shade</p> <p>22 less. If there's weak competition, you would</p> <p>23 shade more.</p> <p>24 The competition for an impression is a</p> <p>25 feature of where it arises from and which</p>

<p style="text-align: right;">Page 238</p> <p>1 THE WITNESS: Multi-calling was a</p> <p>2 strategy that we discussed that Google identified</p> <p>3 some publishers as adopting for the sake of</p> <p>4 finding the best price for its impression.</p> <p>5 BY MR. ISAACSON:</p> <p>6 Q. And there -- there -- there are probably</p> <p>7 other ways -- well, depends what you call it, but</p> <p>8 there's probably multiple ways to price-fish. Is</p> <p>9 that --</p> <p>10 MR. WOLIN: Objection to form.</p> <p>11 THE WITNESS: Broadly speaking, I would</p> <p>12 say "price fishing" means -- could mean different</p> <p>13 things to different people.</p> <p>14 BY MR. ISAACSON:</p> <p>15 Q. All right. And have you expressed any</p> <p>16 opinions in your report about whether unified</p> <p>17 -- Google's unified pricing rules had an impact</p> <p>18 in reducing "price fishing"?</p> <p>19 MR. WOLIN: Objection to form.</p> <p>20 THE WITNESS: Most of the discussions</p> <p>21 I've seen around unified pricing rules do not</p> <p>22 talk about "price fishing." They talk about the</p> <p>23 disadvantages that AdX floors face.</p> <p>24 BY MR. ISAACSON:</p> <p>25 Q. Okay. The -- have you seen -- in</p>	<p style="text-align: right;">Page 240</p> <p>1 MR. ISAACSON: Okay. Let's see.</p> <p>2 12-2-23.</p> <p>3 This will be 8? 9?</p> <p>4 THE REPORTER: Correct.</p> <p>5 MR. ISAACSON: You would know.</p> <p>6 MR. WOLIN: Nine now.</p> <p>7 THE REPORTER: Nine.</p> <p>8 THE WITNESS: Nine.</p> <p>9 (Ravi Exhibit No. 9, a printout of an</p> <p>10 article from "Audience Network," Facebook.com/ audienecenetwork/partner-program/code-of-conduct, 12 was introduced.)</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q. All right.</p> <p>15 All right. Exhibit 9 from</p> <p>16 Facebook.com's Code of Conduct -- I believe</p> <p>17 that's now Meta's Code of Conduct. And have you</p> <p>18 -- and for their auctions. Have you seen -- have</p> <p>19 you reviewed Facebook -- materials about Facebook</p> <p>20 auctions before?</p> <p>21 MR. WOLIN: Objection to form.</p> <p>22 THE WITNESS: No. Not in any detail.</p> <p>23 BY MR. ISAACSON:</p> <p>24 Q. Okay. And it says at the bottom of</p> <p>25 Page 2, "Reserve price mechanisms should not be</p>
<p style="text-align: right;">Page 239</p> <p>1 connection with "price fishing", have you also</p> <p>2 seen the concept of self-competition, that</p> <p>3 an advertiser, when it's asked to bid on an</p> <p>4 impression from multiple sources, might</p> <p>5 accidentally compete against its own bid?</p> <p>6 MR. WOLIN: Objection to form.</p> <p>7 THE WITNESS: Yes. I've -- I've seen</p> <p>8 that phenomenon. It's sometimes called</p> <p>9 second-pricing yourself.</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q. Yeah. And that's also not healthy</p> <p>12 for the ad tech ecosystem if advertisers</p> <p>13 inadvertently start competing against their own</p> <p>14 bids.</p> <p>15 MR. WOLIN: Objection to form.</p> <p>16 THE WITNESS: It's a part of the</p> <p>17 fragmentation of the market that we were talking</p> <p>18 about earlier.</p> <p>19 BY MR. ISAACSON:</p> <p>20 Q. Do other ad tech tools or companies have</p> <p>21 similar rules to the unified pricing rules of</p> <p>22 Google?</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: I have not examined that</p> <p>25 in detail.</p>	<p style="text-align: right;">Page 241</p> <p>1 updated dynamically at" -- oh, no, I'm wrong</p> <p>2 -- no, I'm right about that. "When a reserve</p> <p>3 price is applied as part of the auction, it</p> <p>4 should apply identically to all demand sources."</p> <p>5 Does it surprise you that Meta would</p> <p>6 have that in their Code of Conduct for auctions?</p> <p>7 MR. WOLIN: Objection to form.</p> <p>8 THE WITNESS: Yeah. I haven't thought</p> <p>9 deeply about it to cause surprise.</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q. All right. The -- do you know whether</p> <p>12 Google's competitors consider unified pricing</p> <p>13 rules to be a best practice for publishers?</p> <p>14 MR. WOLIN: Objection to form.</p> <p>15 THE WITNESS: Again, I've not examined</p> <p>16 that deeply, no.</p> <p>17 (Ravi Exhibit No. 10, an article from</p> <p>18 Xandr.com titled "Seller Best Practices," was</p> <p>19 introduced.)</p> <p>20 MR. ISAACSON: This will be Exhibit 10.</p> <p>21 THE REPORTER: Here you go, sir.</p> <p>22 MR. WOLIN: Thank you.</p> <p>23 THE REPORTER: You're welcome.</p> <p>24 BY MR. ISAACSON:</p> <p>25 Q. All right. This is from Xandr.com,</p>

<p style="text-align: right;">Page 242</p> <p>1 "Seller Best Practices." And if you flip to the 2 second page, at the bottom you'll see listed as a 3 best practice "to Ensure price floor parity 4 across your tech staff." And it says in the 5 last column, "Establishing consistent price 6 floors minimizes bidder errors and improves 7 bidder decision" -- "decisioning by eliminating 8 ambiguity." 9 All right. Does that surprise you to 10 see that Microsoft's Xandr company lists that as 11 a -- uniform price floors as a best practice? 12 MR. WOLIN: Objection to form. 13 THE WITNESS: Again, I've not thought 14 deeply enough to form a impression of surprise or 15 otherwise. 16 BY MR. ISAACSON: 17 Q. Right. When you say you haven't thought 18 deeply about it, are you saying that while you're 19 critical of Google implementing uniform pricing 20 rules, that you have no knowledge of whether its 21 competitors consider that to be a best practice 22 in the industry? 23 MR. WOLIN: Objection to form. 24 THE WITNESS: My opinions about uniform 25 pricing rules of Google come from examining the</p>	<p style="text-align: right;">Page 244</p> <p>1 whether these rules were appropriate for Google 2 or any of its competitors? 3 MR. WOLIN: Objection to form. 4 BY MR. ISAACSON: 5 Q. Referring to the unified pricing rules. 6 MR. WOLIN: Same objection. 7 THE WITNESS: My general understanding 8 is that the industry supported exchange-specific 9 floors, which the publishers were used to. And 10 that's what the publishers were complaining about 11 when unified pricing rules were introduced by 12 Google. 13 BY MR. ISAACSON: 14 Q. All right. So what time period are you 15 talking about where the pub -- you think that the 16 publishers were used to having exchange-specific 17 floors? 18 A. Around the time of the introduction of 19 unified pricing rules. That would be around 20 2019. 21 Q. All right. And since 2019, in the last 22 five years, do you know whether the industry has 23 moved towards unified pricing rules? 24 MR. WOLIN: Objection to form. 25 THE WITNESS: While I know they have</p>
<p style="text-align: right;">Page 243</p> <p>1 context in which they were deployed, which is 2 what I describe in the report. 3 I would need to develop sufficient 4 context to understand whether these rules were 5 appropriate or not and whether I should be 6 surprised or not. 7 BY MR. ISAACSON: 8 Q. Right. You have not done the work to 9 date to understand whether these rules were 10 appropriate or not; is that correct? 11 MR. WOLIN: Objection to form. 12 BY MR. ISAACSON: 13 Q. Referring to the unified -- unified 14 pricing rules? 15 MR. WOLIN: Same objection. 16 THE WITNESS: I did the work related to 17 Google's platform in examining the context of its 18 unified pricing rules. 19 BY MR. ISAACSON: 20 Q. Have you developed sufficient context to 21 understand whether these rules were Google -- 22 were appropriate for Google -- well, let me put 23 it this way -- I'll start over. 24 Have you developed sufficient context by 25 looking at the entire industry to understand</p>	<p style="text-align: right;">Page 245</p> <p>1 moved towards the first-price auction format, I 2 don't know all the details of the floors that 3 they enforce. 4 BY MR. ISAACSON: 5 Q. All right. The -- do you agree with 6 the statement in the Microsoft Xandr document 7 that establishing consistent price floors 8 minimizes bidder errors? 9 MR. WOLIN: Objection to form. 10 THE WITNESS: Thank you. 11 I think this is referring to what you 12 were talking about earlier, the potential of 13 bidding and -- via different intermediaries. 14 BY MR. ISAACSON: 15 Q. And do you agree with that statement, 16 that establishing consistent price floors 17 minimizes bidder error -- errors. 18 MR. WOLIN: Objection to form. 19 THE WITNESS: Broadly speaking, as you 20 characterized it earlier, that would be true. 21 BY MR. ISAACSON: 22 Q. And do you agree, broadly speaking, that 23 establishing consistent price floors improves 24 bidder decisioning by eliminating ambiguity? 25 MR. WOLIN: Objection to form.</p>

<p style="text-align: right;">Page 246</p> <p>1 THE WITNESS: That is of the same</p> <p>2 nature.</p> <p>3 MR. WOLIN: Should we take a break for a</p> <p>4 few minutes when you get to a good spot?</p> <p>5 MR. ISAACSON: Yeah.</p> <p>6 THE VIDEOGRAPHER: Going off the record</p> <p>7 at 4:14.</p> <p>8 (Recess taken.)</p> <p>9 THE VIDEOGRAPHER: Back on the record at</p> <p>10 4:27.</p> <p>11 BY MR. ISAACSON:</p> <p>12 Q. All right. If you'll look at your</p> <p>13 report, Paragraph 216 of your opening report.</p> <p>14 You say, "Google documents and experiment results</p> <p>15 suggest that UPR successfully helped shift</p> <p>16 business to AdX from rival exchanges for which</p> <p>17 publishers had previously set lower price</p> <p>18 floors," and then you cite two documents, I</p> <p>19 believe.</p> <p>20 This would be -- both are from August</p> <p>21 2019. This would be Footnote 498 and 499, right?</p> <p>22 A. Yes, I see that.</p> <p>23 Q. All right. So if we look at August 15,</p> <p>24 2019 -- this will be Exhibit --</p> <p>25 THE REPORTER: 11.</p>	<p style="text-align: right;">Page 248</p> <p>1 A. -- characterizes, yes.</p> <p>2 Q. Yes. Okay. And so their win rate</p> <p>3 dropped about 6 percent.</p> <p>4 A. That's about right.</p> <p>5 Q. So in this one document, this is one</p> <p>6 exchange saying their win rate dropped by 6</p> <p>7 percent in August 2019, correct?</p> <p>8 A. That's what the document says, yes.</p> <p>9 Q. Okay. And did you do anything to</p> <p>10 evaluate the methodology behind Rubicon's</p> <p>11 figures?</p> <p>12 MR. WOLIN: Objection to form.</p> <p>13 THE WITNESS: I did not do any</p> <p>14 independent analysis of their characterization.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q. Okay. You did not -- you don't -- you</p> <p>17 don't know how Rubicon got these figures, right?</p> <p>18 A. It seems to come from an internal chart</p> <p>19 in Rubicon.</p> <p>20 Q. Right. But you haven't -- you haven't</p> <p>21 seen any of the data or you don't know how they</p> <p>22 went about creating this.</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: Yeah. I'm not privy to</p> <p>25 how this chart was created.</p>
<p style="text-align: right;">Page 247</p> <p>1 MR. WOLIN: 11.</p> <p>2 MR. ISAACSON: 11?</p> <p>3 THE REPORTER: Yes.</p> <p>4 THE WITNESS: Thank you.</p> <p>5 (Ravi Exhibit No. 11, a document</p> <p>6 Bates Numbered GOOG-DOJ-15044036 through</p> <p>7 GOOG-DOJ-15044043, was introduced.)</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q. All right. So Ravi Exhibit 11 is Bates</p> <p>10 stamped GOOGLE-DOJ-15044036 through 4043. It's</p> <p>11 dated August 26th, 2019. The footnote says</p> <p>12 August 15th, but it does have the same Bates</p> <p>13 stamp numbers you'll see. And for all I know</p> <p>14 that got picked up in an errata. But the -- and</p> <p>15 this is a memo from the Rubicon project that is</p> <p>16 on Page 039.</p> <p>17 Okay. And -- all right. So -- and the</p> <p>18 gentleman from Rubicon reports, "We went from a</p> <p>19 consistent 29 to 30 percent render rate to one</p> <p>20 now closer to 23 to 24 percent."</p> <p>21 And the render rate is their win rate.</p> <p>22 Is that how you understand it?</p> <p>23 A. That's what the first line in the next</p> <p>24 page --</p> <p>25 Q. Yes.</p>	<p style="text-align: right;">Page 249</p> <p>1 BY MR. ISAACSON:</p> <p>2 Q. And you did not evaluate the extent to</p> <p>3 which any effects reported here continued after</p> <p>4 August 2019, correct?</p> <p>5 MR. WOLIN: Objection to form.</p> <p>6 THE WITNESS: I have not investigated</p> <p>7 that.</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q. And this document does not address</p> <p>10 impact on any exchange other than Rubicon,</p> <p>11 correct?</p> <p>12 A. This document backed up the example I</p> <p>13 provided in 216.</p> <p>14 Q. And it was just one example, right?</p> <p>15 MR. WOLIN: Objection to form.</p> <p>16 THE WITNESS: It was an example in 216.</p> <p>17 Yes, one example.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q. And did you evaluate to what extent</p> <p>20 Rubicon's figures were impacted by the unified</p> <p>21 first-price auction as opposed to the unified</p> <p>22 pricing rules?</p> <p>23 MR. WOLIN: Objection to form.</p> <p>24 THE WITNESS: Just to be clear, you're</p> <p>25 asking the effect of the spend of the Rubicon</p>

<p style="text-align: right;">Page 306</p> <p>1 before, I do not analyze any single competitor</p> <p>2 for their effects on experimentation.</p> <p>3 MR. ISAACSON: All right. I think I've</p> <p>4 got five minutes left. I cede it.</p> <p>5 MR. WOLIN: If we can go off the record</p> <p>6 and just take five minutes so I can speak with my</p> <p>7 colleagues, and then we'll come back and see if</p> <p>8 we have any follow-up questions.</p> <p>9 THE VIDEOGRAPHER: All right. We are</p> <p>10 off the record at 6:12 p.m.</p> <p>11 (Recess taken.)</p> <p>12 THE VIDEOGRAPHER: Back on the record at</p> <p>13 6:16.</p> <p>14 EXAMINATION</p> <p>15 BY MR. WOLIN:</p> <p>16 Q. Okay. Professor Ravi, I just have one</p> <p>17 or two questions for you.</p> <p>18 Could you pull out your rebuttal report,</p> <p>19 please, and turn to Paragraph 120 on Page 68?</p> <p>20 A. Yes, I see it. Yeah.</p> <p>21 Q. And the final sentence in Paragraph 120</p> <p>22 reads, "The principal places where I cite source</p> <p>23 code are where there's ambiguity or where the</p> <p>24 code contradicts the documents." Did I read that</p> <p>25 correctly?</p>	<p style="text-align: right;">Page 308</p> <p>1 page are ones that you applied in analyzing the</p> <p>2 conducts that you analyzed in reaching your</p> <p>3 opinions; is that correct?</p> <p>4 A. Yes. I first considered the programs</p> <p>5 that were relevant to the conducts I analyzed.</p> <p>6 And then, from that, I used that to narrow down</p> <p>7 the portion of the snapshots of code where I</p> <p>8 would analyze the -- the logic behind the code</p> <p>9 itself. And then I would use the code that I</p> <p>10 saw, and any additional questions it raised, to</p> <p>11 surface further documents. And I would repeat</p> <p>12 the cycle daily in my source code analysis. Yep.</p> <p>13 MR. WOLIN: Thank you, Professor Ravi.</p> <p>14 We have no further questions.</p> <p>15 MR. ISAACSON: No questions.</p> <p>16 MR. WOLIN: All right. Thank you. The</p> <p>17 deposition has ended.</p> <p>18 THE VIDEOGRAPHER: All right. If that</p> <p>19 is everything, off the record on February 20th,</p> <p>20 2024, at 6:19 p.m.</p> <p>21 (Deposition concluded -- 6:19 p.m.)</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>
<p style="text-align: right;">Page 307</p> <p>1 A. That's what I wrote in the last</p> <p>2 sentence.</p> <p>3 Q. And is that a true and accurate</p> <p>4 statement of the work that you did in this case?</p> <p>5 A. Yes. The principal places. There might</p> <p>6 be one or other citations that -- to corroborate</p> <p>7 other things. But the principal places where I</p> <p>8 cite them are to clarify ambiguity or</p> <p>9 contradictions.</p> <p>10 Q. And if you look at the bottom of that</p> <p>11 page, carrying onto the next page, do you see</p> <p>12 Paragraph 123?</p> <p>13 A. Yes, I see it.</p> <p>14 Q. And specifically Subparagraph B that</p> <p>15 starts, "Second, I personally conducted and</p> <p>16 oversaw others." Do you see that?</p> <p>17 A. Yes. I remember that description.</p> <p>18 Q. And Subparagraph B explains the</p> <p>19 methodology you applied in reviewing source code;</p> <p>20 is that correct?</p> <p>21 A. Yes. This paragraph was in the context</p> <p>22 of my response to Professor Rinard's claims, and</p> <p>23 it lays out the steps that I carried out in -- in</p> <p>24 performing my own source code analysis.</p> <p>25 Q. And the steps that are written on this</p>	<p style="text-align: right;">Page 309</p> <p>1 C E R T I F I C A T E</p> <p>2</p> <p>3 I do hereby certify that I am a Notary</p> <p>4 Public in good standing, that the aforesaid</p> <p>5 testimony was taken before me, pursuant to</p> <p>6 notice, at the time and place indicated; that</p> <p>7 said deponent was by me duly sworn to tell the</p> <p>8 truth, the whole truth, and nothing but the</p> <p>9 truth; that the testimony of said deponent was</p> <p>10 correctly recorded in machine shorthand by me and</p> <p>11 thereafter transcribed under my supervision with</p> <p>12 computer-aided transcription; that the deposition</p> <p>13 is a true and correct record of the testimony</p> <p>14 given by the witness; and that I am neither of</p> <p>15 counsel nor kin to any party in said action, nor</p> <p>16 interested in the outcome thereof.</p> <p>17</p> <p>18 WITNESS my hand and official seal this</p> <p>19 22nd day of</p> <p>20 </p> <p>21</p> <p>22 Notary Public</p> <p>23</p> <p>24</p> <p>25</p>